CONTENTS

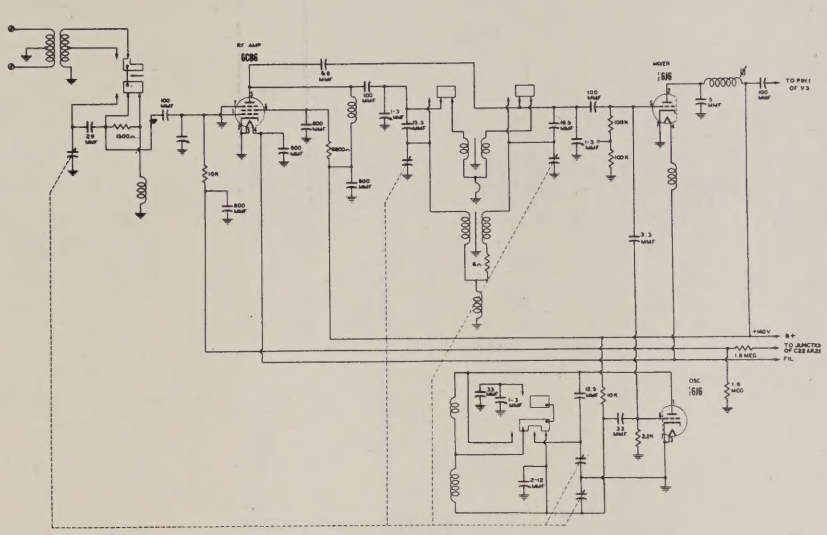
TRADE NAME	MODEL	SET AND FOLDER No.
Airline	15WG-3049A, B, 15WG-3059A Tel. Rec.	164-2
Brush	BK-437, BK-437S, BK-439, BK-441, BK-442, BK-443P Recorder	164-3
Knight	20H611	164-4
Monitoradio	AR-1	164-5
Muntz	2060 Tel. Rec.	164-6
Norelco	588A Tel. Rec.	164-7
Radio Craftsmen	500	164-8
Sparton	4916, 4917, 4918 (Ch. 24TL10), 4920, 4921, 4922 (Ch. 24TM10) Tel. Rec.	164-9
Steelman	595	164-10
Stewart-Warner	9204-A Tel. Rec.	164-11
Tele-Tone	TV374 (Ch. 8001, 8002, 8003) Tel. Rec. Prod. Chg. Bul. 35	164-1
Westinghouse	H-653K24 (Ch. V-2202-3, V-2210-1) Tel. Rec. Prod. Chg. Bul. 35	164-1

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 11 IN SET 145

TELETONE MODEL TV-374
(Ch. 8001, 8002, 8003)

Teletone Model 374 is electrically identical to Teletone Model TV-330 covered in Photofact Folder 11 in Set 145 except for the use of a different tuner part number TTU108-D.

A schematic of the new tuner is shown below.



SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 13 IN SET 160

WESTINGHOUSE MODEL H-653K24
(Ch. V-2202-3, V2210-1)

In later production a chassis designated V-2202-3 is used in place of the original V-2202-2. Chassis V-2202-3 employs two 5U4G rectifier tubes in parallel, and the power transformer was changed to one with a higher current rating Part #V-9958-4. Two 110Ω Resistors in parallel were connected in series with the filter choke to drop the output voltage to the correct value.

Other production changes on chassis V-2202-3 and V-2210-1 are as follows:

TO ELIMINATE PICTURE INTERFERENCE.

To eliminate a possible source of 4.5MC "tweet" interference on the picture, RF decoupling of the tone control was provided by adding a 150Ω Resistor between the tone control jack and C68.

AUDIO IMPROVEMENT

To suppress high frequency noise C69 was changed to .02MFD and C61 changed to .002MFD. To increase the audio gain R62 was changed to a 1Meg Resistor.

HORIZONTAL HOLD

In later production chassis C87 was changed to a 100MMF capacitor and was shunted with a 4-40MMF trimmer capacitor. To adjust the trimmer short out the ringing coil (L31), set the horizontal hold to mid-position, and adjust the trimmer until the picture is in sync. Without touching the hold control, remove the short from across the ringing coil and adjust the ringing coil until the picture is in sync.

PICTURE SHAPE DISTORTION

To eliminate a tendency towards picture distortion with advancement of the contrast control beyond a certain point the following changes were made:

C86 was changed to .1MFD
The negative end of C6 was removed from ground and connected to the +285V line.
A 30MFD was added in parallel with C1.
A 180MMF capacitor was added from Pin 5 of V18, horizontal output tube, to ground.
A 56MMF capacitor was added from terminals 5 to 8 of the T2, horizontal output transformer.
R37 and R42 were both changed to 220KΩ
R79 was disconnected from the lead going to Pin 10 of the picture tube and connected to the B plus line for the vertical output stage.

PROPERTY OF
L. F. BLANKENSHIP
[illegible] MEADE ST.
[illegible], COLORADO

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PRODUCTION CHANGES
BULLETIN 35

PRODUCTION CHANGES
BULLETIN 35

PHOTOFACT* Folder

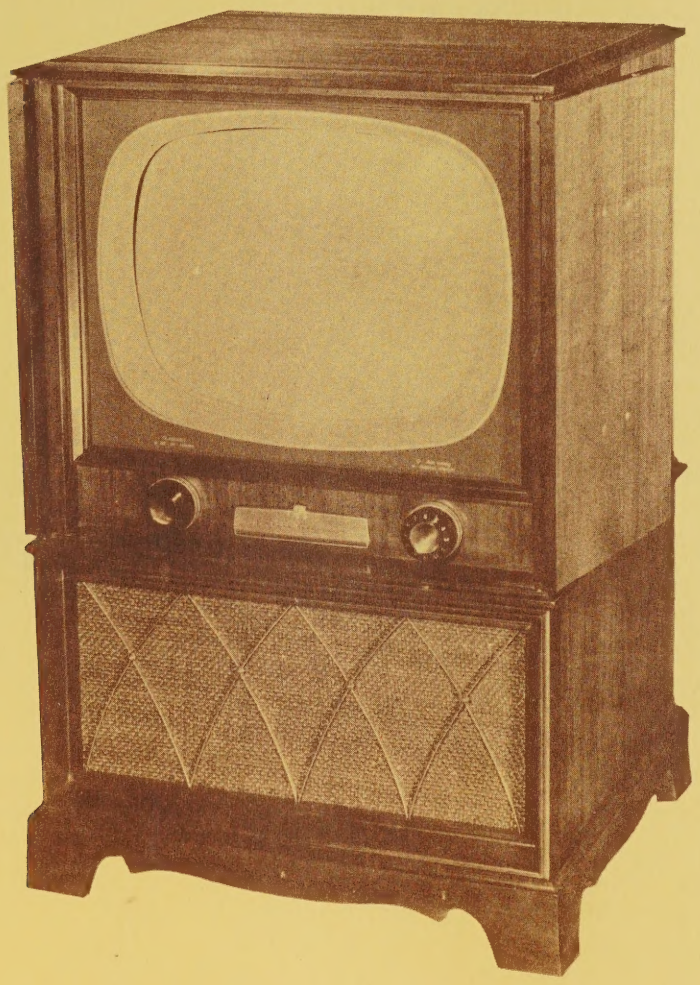
*TRADE MARK

AIRLINE
MODELS 15WG-3049A, B, 15WG-3059A

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 15WG-3049B

AIRLINE
MODELS 15WG-3049A, B, 15WG-3059A

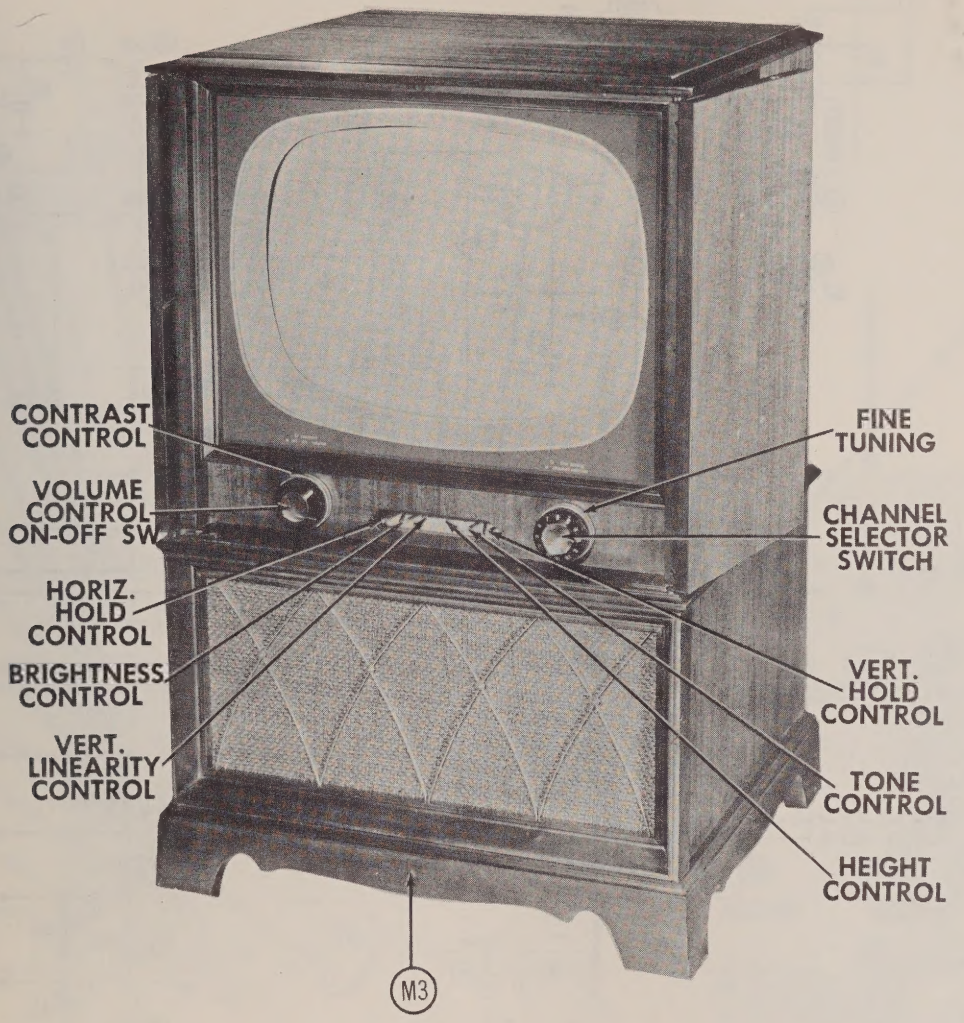
HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 4-52 SET 164 FOLDER 2

PROPERTY OF
C. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

AIRLINE
MODELS 15WG-3049A, B, 15WG-3059A



AIRLINE MODEL 15WG-3049B

TRADE NAME	Airline Models 15WG-3049A, B, 15WG-3059A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty Three

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.2 Amp. @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13

INDEX

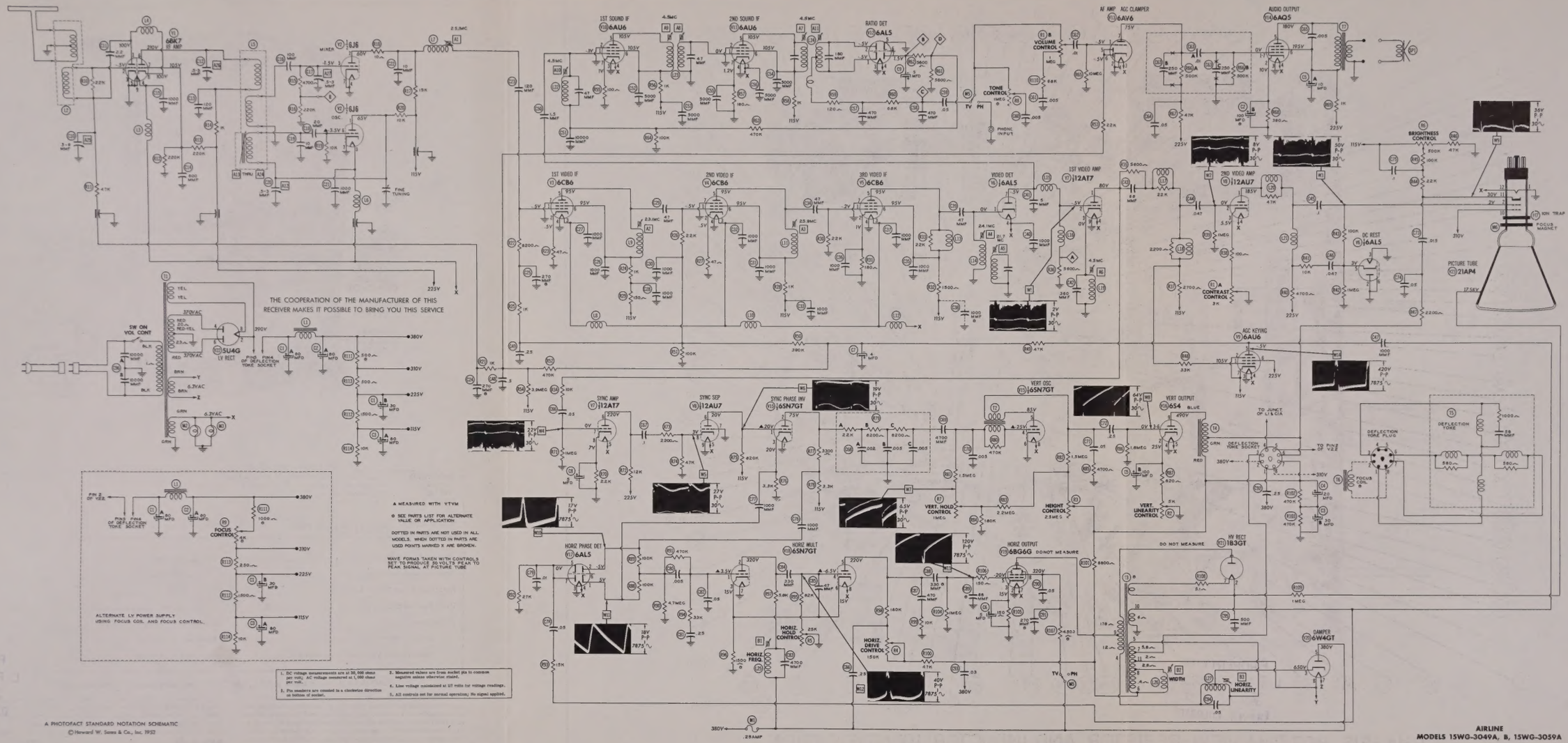
Alignment Instructions 6, 7
Disassembly Instructions 11
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 12, 13, 14
Photographs
Cabinet - Rear View 11
Capacitor and Alignment Identification 4, 9
Photographs (cont.)
Chassis - Top View 3
RF Tuner 10
Resistor and Inductor Identification 15, 16
Resistance Measurements 8
Schematic 2
Tube Placement Charts 5

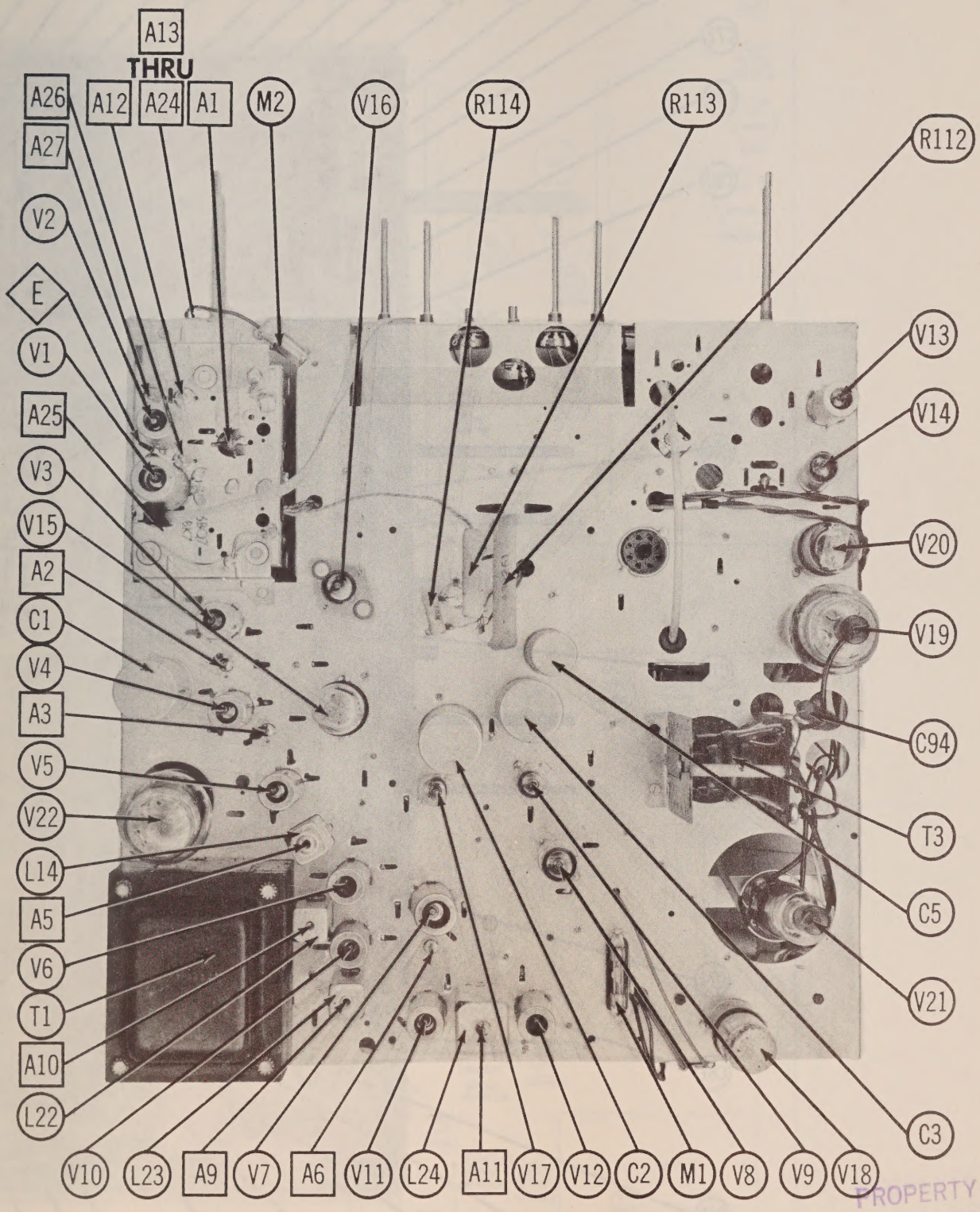
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

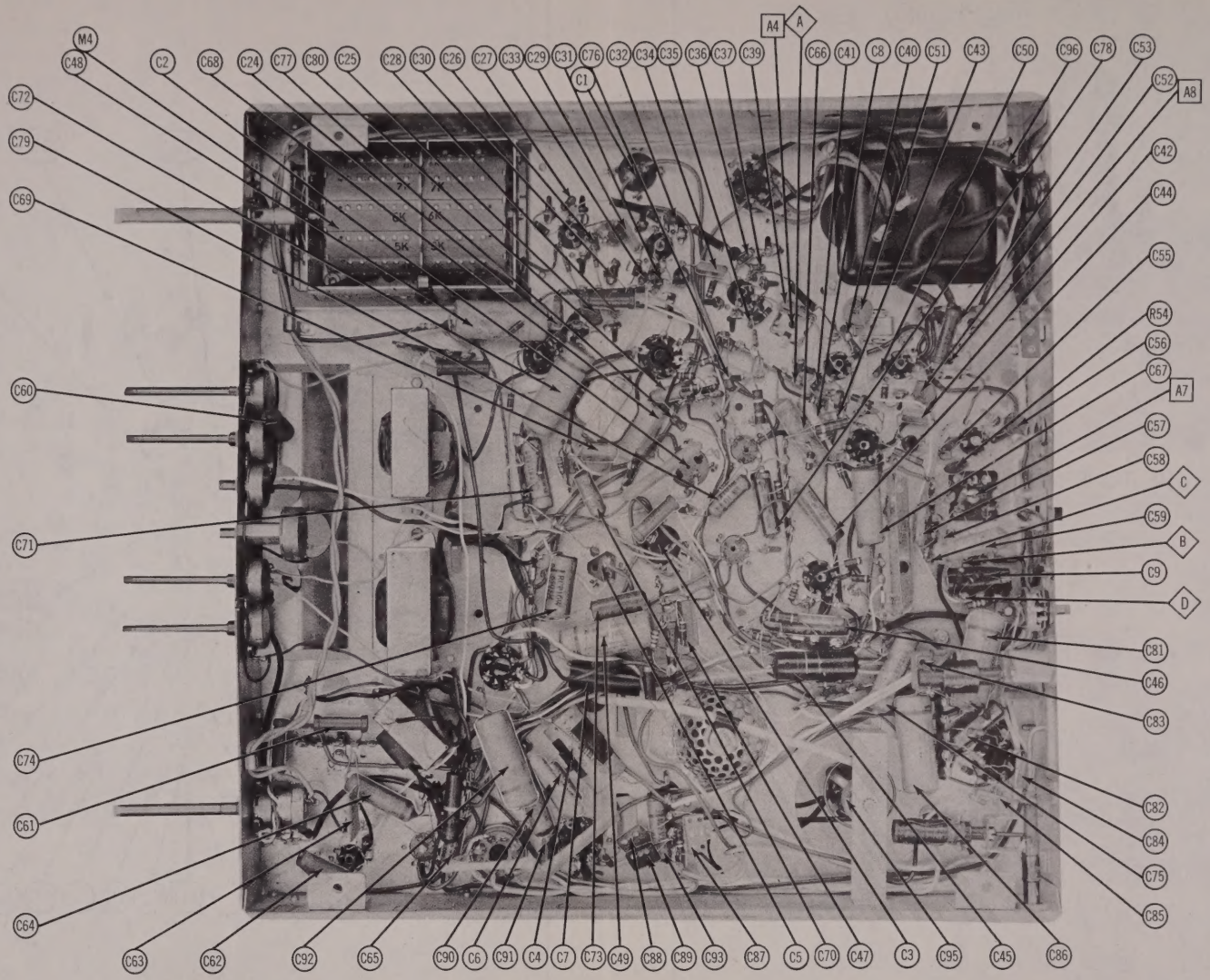
AIRLINE
MODELS 15WG-3049A, B, 15WG-3059A


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
ALTERNATE LV POWER SUPPLY USING FOCUS COIL AND FOCUS CONTROL.
A MEASURED WITH VTVM
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Measured values are from socket pin to common negative unless otherwise stated.
3. Pin numbers are counted in a clockwise direction as bottom of socket.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1952
AIRLINE
MODELS 15WG-3049A, B, 15WG-3059A



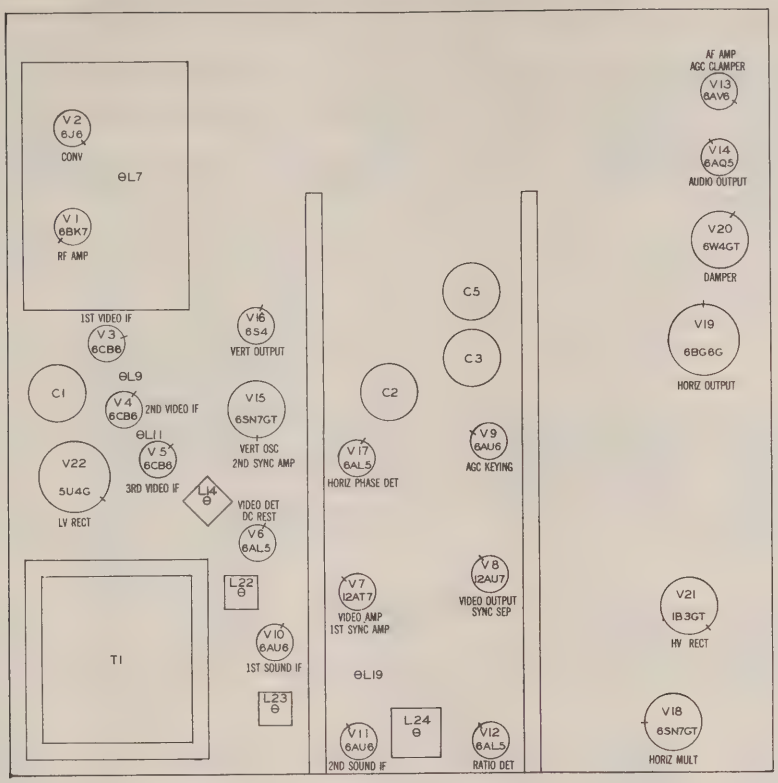
CHASSIS TOP VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

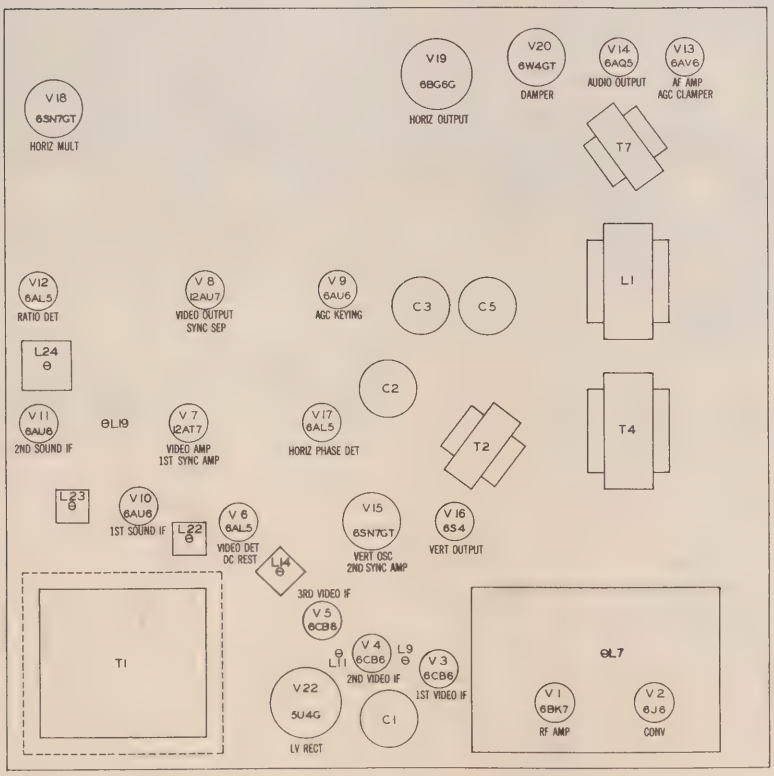


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
E. F. BLANKEN
3824 MEADE
DENVER, COLO



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V18), from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of a C49, connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube.	25.1MC (unmod .)	Any	DC probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.1MC	"	"	A2	"
3.	"	"	25.9MC	"	"	A3	"
4.	"	"	24.1MC	"	"	A4	"
5.	"	"	21.7MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MC Swp)	21.7MC 23MC 26.2MC	Any	Vert. Amp. thru 25KΩ to point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A1 thru A4 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	10KΩ carbon resistor	High side thru 10KΩ to Pin 7, (cathode) of 6AL5 (V6). Low side to chassis.	4.5MC (unmod.)	Any	DC probe thru detector, (Fig.2), to picture tube grid. Common to chassis.	A6	Adjust for MINIMUM deflection

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to Pin 1, (grid) of 6AU6, (V10). Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point (B). Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
9.	10KΩ carbon resistor	High side thru 10KΩ to Pin 7, (cathode) of 6AL5, (V6). Low side to chassis.	"	"	"	A10	"
10.	"	"	"	"	DC probe to Point (C). Common to Point (D).	All	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to pin 1, (grid) of 6AU6, (V10). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A7, A8, A9	Disconnect stabilizer capacitor C9. Adjust for maximum amplitude and symmetry as per fig. 3.
9.	10KΩ carbon resistor	High side thru 10KΩ to pin 7, (cathode), of 6AL5 (V6). Low side to chassis	"	"	"	"	A10	"
10.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	All	Reconnect capacitor. Adjust All so 4.5MC occurs at center of crossover lines as per fig. 4. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

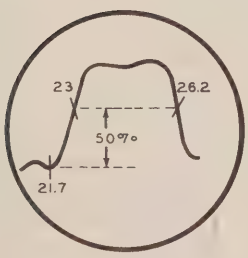


FIG.1

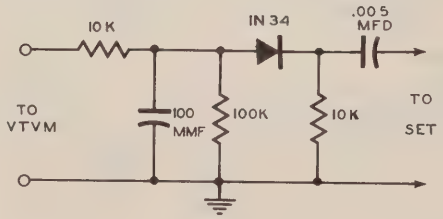


FIG.2

FIG. 3

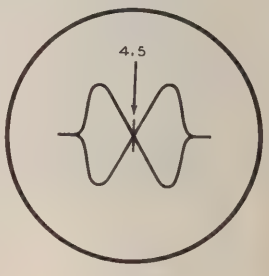


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A12. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A12 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the escilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC swp.)	211.25MC 215.75MC	13	Vert. amp. thru 25KΩ to Point (A) Low side to chassis.	A13	Adjust to place sound markers in trap "notch" as shown in Fig. 5. The video marker should be at 50%
			207MC (10MC swp.)	205.25MC 209.75MC	12		A14	
			201MC (10MC swp.)	199.25MC 203.75MC	11		A15	
			195MC (10MC swp.)	193.25MC 197.75MC	10		A16	
			189MC (10MC swp.)	187.25MC 191.75MC	9		A17	
			183MC (10MC swp.)	181.25MC 185.75MC	8		A18	
			177MC (10MC swp.)	175.25MC 179.75MC	7		A19	
			85MC (10MC swp.)	83.25MC 87.75MC	6		A20	
			79MC (10MC swp.)	77.25MC 81.75MC	5		A21	
			69MC (10MC swp.)	67.25MC 71.75MC	4		A22	
			63MC (10MC swp.)	61.25MC 65.75MC	3		A23	
			57MC (10MC swp.)	55.25MC 59.75MC	2		A24	

RF AND MIXER ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC swp.)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to Point (E) Low side to chassis.	A25, A26, A27	Adjust for response curve similar to Fig. 6 with markers above 90%.
13.	"	"	213MC (10MC swp.)	211.25MC 215.75MC	13	"		Check all channels for response curve similar to Fig. 6. If markers fall below 70% on any channel make slight adjustment of A25, A26 and A27 with channel switch set for that channel. Recheck all channels to see that they have not been seriously affected.
			201MC (10MC swp.)	199.25MC 203.75MC	11			
			195MC (10MC swp.)	193.25MC 197.75MC	10			
			189MC (10MC swp.)	187.25MC 191.75MC	9			
			183MC (10MC swp.)	181.25MC 185.75MC	8			
			177MC (10MC swp.)	175.25MC 179.75MC	7			
			85MC (10MC swp.)	83.25MC 87.75MC	6			
			79MC (10MC swp.)	77.25MC 81.75MC	5			
			69MC (10MC swp.)	67.25MC 71.75MC	4			
			63MC (10MC swp.)	61.25MC 65.75MC	3			
			57MC (10MC swp.)	55.25MC 59.75MC	2			

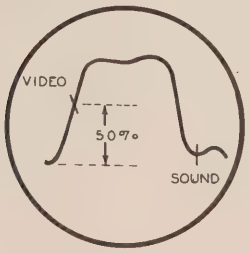


FIG.5

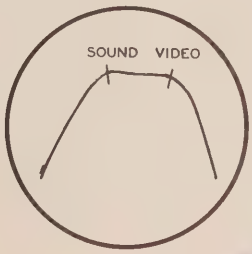
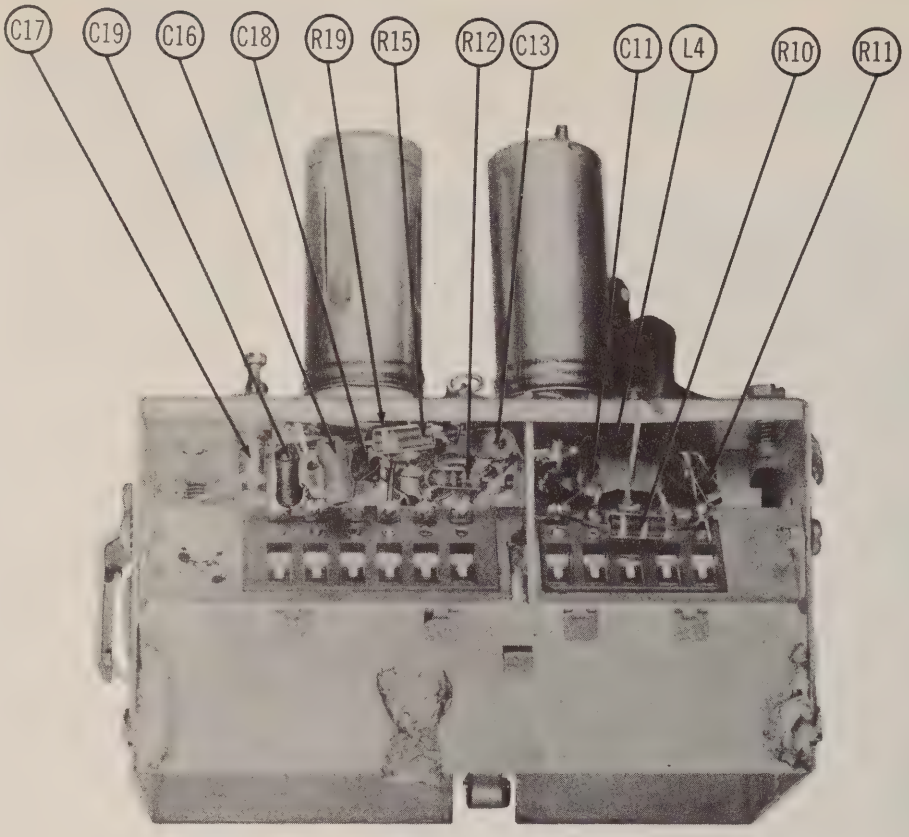


FIG.6

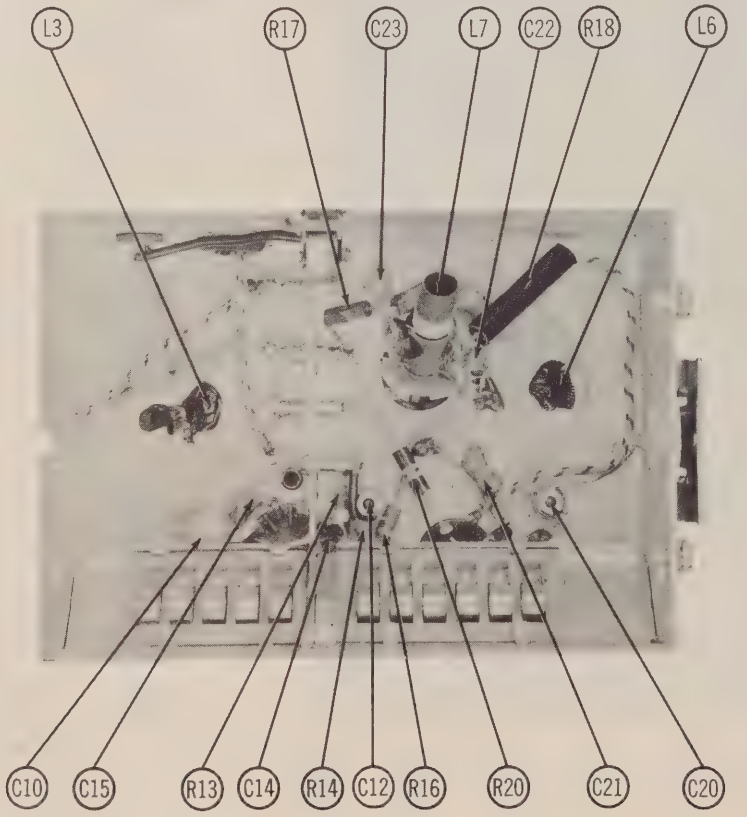
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	750KΩ	0Ω	.1Ω	0Ω	†2KΩ	110KΩ	INF	0Ω
V 2	6J6	†12KΩ	†17KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	110KΩ	47Ω	.1Ω	0Ω	†3.7KΩ	†3.7KΩ	0Ω		
V 4	6CB6	120KΩ	47Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 5	6CB6	22KΩ	180Ω	.1Ω	0Ω	†4.1KΩ	†4.1KΩ	0Ω		
V 6	6AL5	.6Ω	0Ω	0Ω	.1Ω	1Meg	0Ω	5.6KΩ		
V 7	12AT7	†11KΩ	5.6KΩ	.3Ω	.1Ω	.1Ω	†13KΩ	1Meg	22KΩ	0Ω
V 8	12AU7	†5.7KΩ	1Meg	1.2KΩ	.1Ω	.1Ω	†820KΩ	0Ω	47KΩ	0Ω
V 9	6AU6	†38KΩ	†2.5KΩ	0Ω	.1Ω	400KΩ	†1KΩ	†2.5KΩ		
V 10	6AU6	100KΩ	0Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	100Ω		
V 11	6AU6	2.5Ω	0Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	180Ω		
V 12	6AL5	INF	INF	0Ω	.1Ω	0Ω	INF	11KΩ		
V 13	6AV6	10Meg	0Ω	.1Ω	0Ω	700KΩ	700KΩ	†500KΩ		
V 14	6AQ5	500KΩ	390Ω	0Ω	.1Ω	†2.5KΩ	†2KΩ	500KΩ		
V 15	6SN7GT	†820KΩ	†9.1KΩ	3.3KΩ	2.1Meg	#2.1Meg	0Ω	0Ω	.1Ω	
V 16	6S4	INF	1.5KΩ	1.8Meg	0Ω	.1Ω	1.8Meg	INF	INF	#7.3KΩ
V 17	6AL5	4.8Meg	4.8Meg	0Ω	.1Ω	27KΩ	INF	27KΩ		
V 18	6SN7GT	5.1Meg	†5.6KΩ	1.5KΩ	90KΩ	#300KΩ	1.5KΩ	0Ω	.1Ω	
V 19	6BG6G	INF	0Ω	150Ω	†50Ω	1Meg	1Meg	.1Ω	†4.8KΩ	TOP CAP #18Ω
V 20	6W4GT	INF	#6.8KΩ	200KΩ	INF	†58Ω	#12Ω	#9Ω	#9Ω	
V 21	1B3GT	PINS 1 THROUGH 8 HAVE INF RESISTANCE								TOP CAP #200Ω
V 22	5U4G	INF	9.5KΩ	INF	20Ω	INF	23Ω	INF	9.5KΩ	
V 23	21AP4	0Ω	1.1Meg	PIN 10 †550Ω	PIN 11 165KΩ	PIN 12 .1Ω				

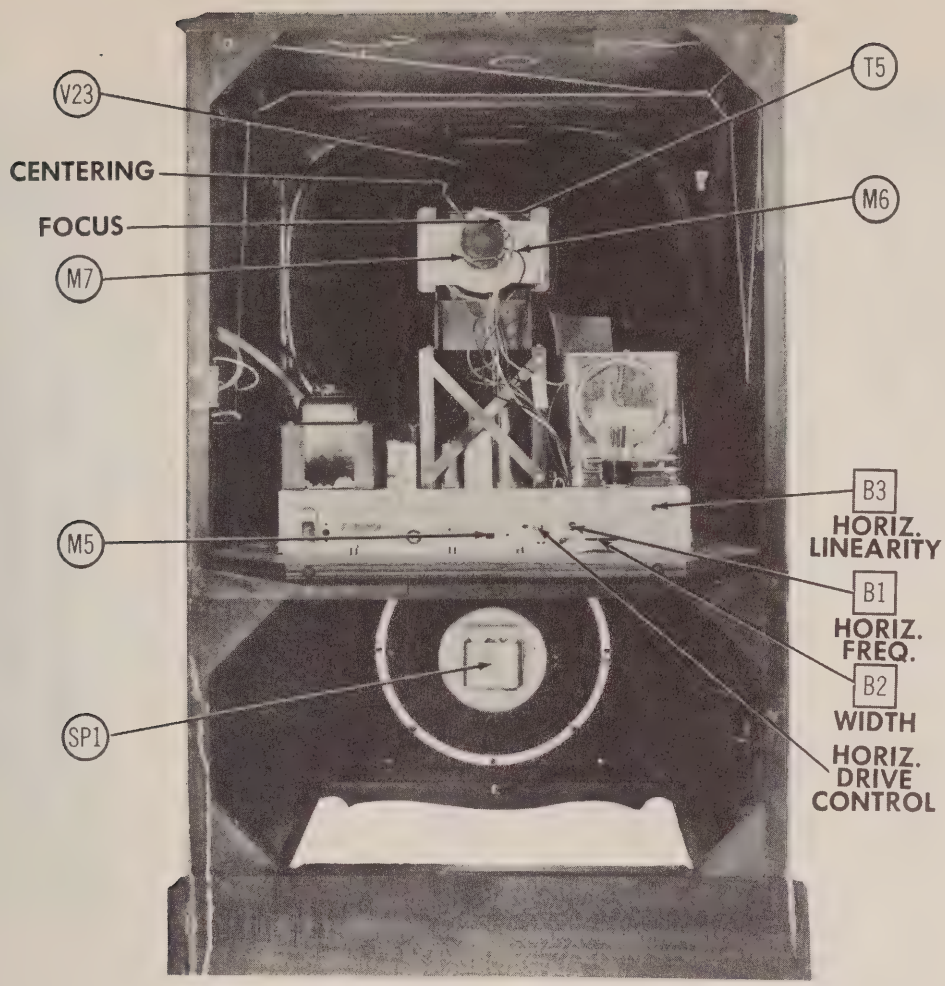
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 2 OF V22
# MEASURED FROM PIN 3 OF V20



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid position of its range.

Adjust the horizontal frequency slug, (B1), to the center of the range over which the picture synchronizes horizontally.

Turn the horizontal drive control clockwise until bright vertical lines appear in the picture, then turn counter clockwise until the bright lines just disappear.

Adjust the width slug, (B2) until the picture is slightly wider than necessary to fill the mask horizontally.

Adjust the horizontal linearity slug, (B3) until the picture is symmetrical from left to right.

Since both width and horizontal linearity are effected by the drive control, it may be necessary to adjust them alternately for optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type Control Knobs from front Panel.
2. Remove Screws holding Rear Cover. Remove Cover.
3. Disconnect Built in Antenna
4. Remove 2 wood screws and remove antenna bracket from Cabinet.
5. Disconnect Speaker
6. Remove Jewel Light from Cabinet.
7. Remove 4 Speaker Mounting nuts. Remove Speaker.
8. Remove 5 Chassis Bolts. Remove Chassis.

Note. For Picture Tube Removal it is necessary to remove Chassis as outlined above.

PROPERTY OF
L. F. BLANKENSHIP
332A MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BK7	6BK7		Alternates-6AQ5(TBD), 6BC5(TBD), 6CB6(TCM), 6BQ7(RAJ)
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	TCM	
V4	2nd. Video IF Amp.	6CB6	6CB6	TCM	
V5	3rd. Video IF Amp.	6CB6	6CB6	TCM	
V6	Video Detector DC Restorer	6AL5	6AL5	6BT	
V7	1st. Video Amplifier Sync. Amplifier	12AT7	12AT7	9A	
V8	2nd. Video Amp. Sync. Seperator	12AU7	12AU7	9A	
V9	Keyed AGC	6AU8	6AU8	7BK	
V10	1st. Sound IF Amp.	6AU8	6AU8	7BK	
V11	2nd. Sound IF Amp.	6AU8	6AU8	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier- AGC Clamper	6AV6	6AV8	7BT	
V14	Audio Output	6AQ6	6AQ6	7BZ	
V15	Sync. Phase Inv. Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V16	Vert. Output	884	8AC		
V17	Horiz. Phase Det.	6AL5	6AL5	6BT	
V18	Horiz Mult.	6SN7GT	6SN7GT	8BD	
V19	Horiz. Output	6BG6G	6BG6G	5BT	
V20	Damper	6W4GT	6W4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	4E	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V23	21AP4	21AP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	450	45X376	AFH2-84	TT	UP8445		TVL-2777	▲ Filter
B	30	450							▲ Decoupling
C2A	80	450	45X384	AFH3-143		UPT4445 V10		TVL-3764	▲ Filter
B	100	50							
C3A	80	450	45X376	AFH3-44		UP8445		TVL-2777	▲ Audio Output Cathode † ▲ Decoupling
B	30	450							▲ Vert. Output Dev.
C4	20	450	45X382	PR5450/20		BR2045A		TVA-1709	Vert. Output Dev.
C5A	10	450	45X385	AFH3-156		UPT2150 V10		TVL-1705 TVA-1310	▲ Audio Output Dev. ▲ Vert. Output Cathode
C6	5	25	45X378	PR8150/4		BR550		TVA-1203	Horiz. Output Cathode
C7	4	100	45X381	PR8150/4		BR415		TVA-1402	AGC Filter
C8	5	25	45X378	PR8150/4		BR550		TVA-1203	Sync. Amp. Cathode
C9	5	25	45X378	PR8150/4		BR-550		TVA-1203	Horiz. Cathode
C10	3-9				829-10				Stabilizing Cap. Variable Trimmer
C11	2.2			TCZ-2.2	TT		NP0K-2R2		Neutralizing Cap.
C12	.5-3				829-3				Variable Trimmer
C13	120			SI120		D6-121	TM5T12	GP2K-121	5GA-T12 RF Amp. Plate Dec.
C14	800			DD-800		D8-801	TM5T8	801-001	5HK-D1 RF Amp. Grid Dec.
C15	1000			SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 RF Amp. Fil. Bypass
C16	100			SI100		D8-101	TM5T1	GP1K-101	5GA-T1 RF Coupling
C17	5-3					829-3		GP2L-121	Variable Trimmer
C18	30			SI20NP0		TCZ-20	NP0K-200		Osc. Grid Cap.
C19	10			SI10N750		TCN-10	N750K-100	5TCU-Q1	Fixed Trimmer
C20	5-3					829-3			Variable Trimmer
C21	1000			SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 Osc. Fil. Bypass
C22	10			SI10NP0		TCZ-10	NP0K-100	5TCC-Q1	Fixed Trimmer
C23	120			SI120		D6-121	TM5T12	GP2K-121	5GA-T12 IF Coupling
C24	270	500		I468-0003		D6-271	5W5T3	GP2K-271	M5-33 AGC Filter †
C25	270	500		I468-0003		D8-271	5W5T3	GP2K-271	M5-33 AGC Filter †
C26	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 1st. Video IF Dec.
C27	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 1st. Video IF Fil.
C28	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 RF Bypass
C29	47	500	47X565	I468-00005		D8-470	5W5Q8	GP1K-470	1FM-45 IF Coupling
C30	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 AGC Filter
C31	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 2nd. Video IF Dec.
C32	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 2nd. Video IF Fil.
C33	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 RF Bypass
C34	47	500	47X565	I468-00005		D8-470	5W5Q8	GP1K-470	1FM-45 IF Coupling
C35	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 3rd. Video IF Dec.
C36	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 3rd. Video IF Cathode
C37	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 3rd Video IF Fil.
C38	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 RF Bypass *
C39	47	500	47X565	I468-00005		D8-470	5W5Q8	GP1K-470	1FM-45 IF Coupling
C40	1000		47X519	SI1000		D8-102	TM5D1	GP2L-102	5HK-D1 Video Det. Fil. Bypass
C41	5		47X562	SI5NP0	TCZ-4.7		NP0K-050		Video Det. Filter
C42	360	500	47X568						Fixed Trimmer
C43	68		47X589					B750K-680	5TCUQ68 Video Coupling
C44	.047	400	47X397	P488-047		DF-503	PTE4547		4TM-S47 Video Coupling
C45	.1	600	46X403	P688-1		DF-104	PTE5P1		6TM-P1 Video Coupling
C46	.047	400	47X397	P488-047		DF-503	PTE4547		4TM-S47 Video Coupling
C47	1000	500	47X569	I464-001			IR5D5		M5-31 Horiz. Feedback
C48	.25	300	B65504	P284-5			P12P5		3TM-P5 AGC Filter
C49	.25	600	B65354	684-25			PTE5P25		6TM-P25 AGC Filter
C50	1.5		47X584	SI1.5NP0	TCZ-1.5		NP0K-1R5		Sound IF Coupling
C51	1000		47X519	SI1000	D8-102	TM5D1	GP2L-102	5HK-D1	AVC Filter
C52	5000		47X507	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st Sound IF Dec.
C53	5000		47X507	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C54	5000		47X507	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd Sound IF Dec.
C55	5000		47X507	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd Sound IF Cathode
C56	5000		47X507	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd Sound IF Fil.
C57	470	500	47X525	I468-0005	D8-471	5W5T5	GP2K-471	1FM-35	Diode Load Cap.
C58	470	500	47X525	I468-0005	D8-471	5W5T5	GP2K-471	1FM-35	De-emphasis
C59	.05	400	46X397	P488-05		DF-503	PTE4535	4TM-S5	Audio Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C60	.005	400	D65502	P688-005		D6-502	PTE6D5	GP2-333-503	6TM-D5 Tone Comp.
C61	.005	600	B65502	P688-005		D6-502	PTE6D5	GP2-333-502	6TM-D5 Tone Comp.
C62	.01	200	B65103	P488-01		D6-103	PTE4S1	GP2-333-103	4TM-S1 Audio Coupling
C63A	.01								Audio Coupling
B	250			†76X6		†PC-80			†103C1 Af Amp. Plate Bypass
C									Audio Output Grid
C64	.05	400	D65503	P488-05		DF-503	PTE435		4TM-S5 RF Bypass
C65	.005	600	F65502	P688-005		DF-502	PTE6D5	GP2-333-502	6TM-D5 Audio Output Plate
C66	.05	400	D65503	P488-05		DF-503	PTE485		4TM-S5 Sync. Coupling
C67	.1	400	D65104	P488-1		DF-104	PTE4P1		4TM-P1 Sync. Coupling
C68A	.003			P688-003			PTE6D2	GP2-333-302	Vert. Integrator Net.
B	.005			P688-005		◆PC-100	PTE6D5	GP2-333-502	◆101C1 Vert. Integrator Net.
C	.005			P688-005			PTE6D5	GP2-333-502	Vert. Integrator Net.
C69	4700	500	47X543	I464-005			IR5D6	M8-35	Vert. Osc. Grid Cap.
C70	.005	200	B65502	P688-005		D6-502	PTE6D5	GP2-333-502	6TM-D5 RF Bypass
C71	.05	600	F65503	P688-05		DF-503	PTE635		6TM-S5 Vert. Discharge
C72	.25	600	D65254	684-25			PTE6P25		6TM-P25 Vert. Sweep Coupling
C73	.015	600	F65153	P688-015			PTE6S15		6TM-S15 Vert. Sweep Coupling
C74	.05	600	F65503	P688-05		DF-503	PTE835		6TM-S5 Integrator Net
C75	.1	200	B65104	P288-1		DF-104	P12P1		2TM-P1 Picture Tube Cathode
C76	1000		47X519	SI1000		D6-102	TM5D1	GP2L-102	5HK-D1 Horiz. Sync. Coupling
C77	1000		47X519	SI1000		D6-102	TM5D1	GP2L-102	5HK-D1 Horiz. Sync. Coupling
C78	.05	400	B65503	P488-05		DF-503	PTE4S5		4TM-S5 Horiz. Feedback
C79	.01	200	B65103	P488-01		D6-103	PTE4S1	GP2-333-103	4TM-S1 Voltage Divider
C80	.005	200	B65502	P688-005		D6-502	PTE6D5	GP2-333-502	6TM-D5 Horiz. AFC Filter
C81	.25	600	B65254	684-25			PTE6P25		6TM-P25 Horiz. AFC Filter
C82	.05	400	B65503	P488-05		DF-503	PTE485		4TM-S5 Horiz. AFC Filter
C83	4700	500	47X543	I464-005			IDR5D5		M5-25 Fixed Trimmer
C84	330	500	47X570	I469-00035					Horiz. MV Feedback
C85	47	500	47X565	I469-00005			5R5Q5	M8-45	Horiz. MV Grid Filter
C86	.25	600	D65254	684-25			PTE6P25	6TM-P25	Horiz. MV Decoupling
C87	470	500	47X525	I469-0005			5R5T5	M8-35	Horiz. Discharge
C88	330	500	47X570	I469-00035					Horiz. Sweep Coupling † †
C89	68	500	47X599	I469-00007			5R5Q7	M8-47	Horiz. Output Grid * † ◆
C90	.05	600	F65503	P688-05		DF-503	PTE485	4TM-S5	Horiz. Output Screen
C91	270	500		I469-0003			5R5T3	M8-33	Horiz. Output Screen †
C92	.25	600	D65254	684-25			PTE6P25	6TM-P25	Horiz. Sweep Coupling
C93	.03	400	D65303	P488-03			PTE4S3	4TM-S3	Damper Filter
C94	.05	400	D65503	P488-05			PTE435	4TM-S5	Fixed Trimmer
C95	500	20000	47X560		HV20C	TV3-502	MM-C20TS		HV Filter
C96A	10000			76X8	BPD-01	DD-3-103	TM-5DS1	821-01	5HK-S1 Line Filter
B	10000				BPD-01			821-01	5HK-S1 Line Filter

* Not used in all Models
† Some Models use 40M47D in this application
† Some Models use 1000MMF in this application (Part No. 47X519)
† Items C63A, C63B, C63C, R68A, R68B are combined in one unit
When replacing items seperately C63B and C63C should total 250MMF
◆ Items C68A, C68B, C68C, R79B, R79C are combined in one unit
†† Some Models use 130MMF in this application (Part No. RCM30A131K)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
				"Concentrikit"			
R1A	3000Ω	½		†78X6		8BDT-878-S	Contrast Control - Panel
B	1Meg	½		B13-137X ◆			Volume Control - Tapped @ 200KΩ -Rear
C	Shaft End			E302 ◆			Attach per instructions in "Concentrikit"
D	Switch			76-3 ◆			Attach to R1A per instructions.
R2A	5000Ω	½		40X294	QH-114	AG-19-S	Vert. Linearity Control
B	Shaft			Not Req.	PQ	RS-3	Attach to R2A per instructions.
C	Bushing			Not Req.	S3 ◆	59-186 ◆	Attach to R2A per instructions.
R3A	2.5Meg	½		40X393	QH-239	AG-84-S	AN-83 Height Control
B	Shaft			Not Req.	RQ	FK3-1/4	AK-1 Attach to R3A per instructions.
R4A	150KΩ	½		40X331	QH-130	AG-52-S	AN-44 Horiz. Drive Control
B	Shaft			Not Req.	Not Req.	FK3-1/4	Not Req. Attach to R4A per instructions.
R5A	25KΩ	½		40X336	QH-120	AG-40-S	AN-38 Horiz. Hold Control
B	Shaft			Not Req.	Not Req.	RS-3	AK-4 Attach to R5A per instructions.
R6A	500KΩ	½		40X333	QH-133	AG-58-S	AN-59 Brightness Control
B	Shaft			Not Req.	Not Req.	RS-3	AK-4 Attach to R6A per instructions.
R7A	1Meg	½		40X334	QH-137	AG-61-S	AN-69 Vert. Hold Control
B	Shaft			Not Req.	Not Req.	RS-3	AK-4 Attach to R7A per instructions.
R8A	1Meg	½		40X334		AG-61-S	AN-69 Tone Control - See note 1.
B	Shaft			Not Req.		RS-3	AK-4 Attach to R8A per instructions.
R9	4000Ω	2		40X304			Focus Control - See note 2.

Note 1. Some models use alternate tone control (Part No. 40X354)
* Cut bushing to duplicate original.
Note 2. Focus control omitted when P.M. focalizer is used.
* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ±10% UNLESS OTHERWISE NOTED
R10	22KΩ 20%	½			Antenna Coil Shunt
R11	47KΩ 20%	½		BTS-47K	AGC Network
R12	220KΩ 20%	½			2nd. RF Amp. Grid
R13	220KΩ 20%	½			Bias Network
R14	1000Ω	½		BTS-1000	2nd. RF Amp. Plate Decoupling
R15	4700Ω	½		BTS-4700	Mixer Grid
R16	220KΩ 20%	½			Mixer Grid
R17	15KΩ 20%	½			Mixer Plate
R18	10Ω	½			Parasitic Suppressor
R19	10KΩ	½			Osc. Grid
R20	10KΩ	½			Osc. Plate
R21	1000Ω 20%	½	B85102	BTS-1000	AGC Network
R22	8200Ω 5%	½	B83822	BTS-8200 5%	1st. Video IF Amp. Grid
R23	47Ω 5%	½	B83470		1st. Video IF Amp. Cathode
R24	1000Ω 20%	½	B85102	BTS-1000	1st. Video IF Amp. Decoupling
R25	1000Ω	½	B85102	BTS-1000	AGC Network
R26	22KΩ	½	B3223		2nd. Video IF Amp. Grid
R27	47Ω 5%	½	B83470		2nd. Video IF Amp Cathode
R28	1000Ω 20%	½	B85102	BTS-1000	2nd. Video IF Amp. Decoupling
R29	150Ω	½	B84151	BTS-150	Decoupling
R30	22KΩ	½	B3223		3rd. Video IF Amp. Grid

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R31	180Ω 20%	½	B84181	BTS-180	3rd. Video IF Amp. Cathode
R32	1500Ω 20%	½	B85152	BTS-1500	3rd. Video IF Amp. Decoupling
R33	22KΩ	½	B84223		RF Choke Shunt
R34	10KΩ	½	B84103	BTS 10K	Isolation
R35	5600Ω	½	B83562	BTS-5600	Video Peaking
R36	5600Ω	1	C84562	BTA-5600	1st. Video Amp. Grid
R37	2700Ω 5%	1	C84372	BTA-2700 5%	1st. Video Amp. Plate
R38	100Ω	½	B84101	BTS-100	2nd. Video Amp. Cathode
R39	1Meg 20%	½	B85105	BTS-1Meg	2nd. Video Amp. Grid
R40	4700Ω 5%	1	C84472	BTA-4700 5%	2nd. Video Amp. Plate
R41	10KΩ	½	B84103	BTS-10K	Isolation
R42	1Meg 20%	½	B85105	BTS-1Meg	DC Restorer Load
R43	100KΩ	½	B85104	BTS-100K	Picture Tube Grid
R44	22KΩ 20%	½	B85223	BTS-22K	Picture Tube Cathode
R45	100KΩ 20%	½	B85104	BTS-100K	Picture Tube Cathode
R46	47KΩ	½	B85473	BTS-47K	Voltage Divider
R47	3300Ω 20%	½	B85223	BTS-2200	Vert. Blanking Network
R48	33KΩ	½	B84333	BTS-33K	Keyed AGC Grid
R49	47KΩ 20%	½	B84473	BTS-47K	AGC Network
R50	390KΩ	½	B84394	BTS-390K	AGC Network
R51	100KΩ	½	B84104	BTS-100K	AGC Network
R52	470KΩ	½	B85474	BTS-470K	AGC Network
R53	22KΩ	½	B84223	BTS-22K	AGC Network
R54	3.9Meg	½	B84395	BTS-3.9Meg	Voltage Divider
R55	100Ω	½	B84101	BTS-100	1st. Sound IF Amp. Cathode
R56	1000Ω	½	B85102	BTS-1000	1st. Sound IF Amp. Decoupling
R57	180Ω 20%	½	B85181	BTS-180	2nd. Sound IF Amp. Cathode
R58	1000Ω 20%	½	B85102	BTS-1000	2nd. Sound IF Amp. Decoupling
R59	120Ω	½	B84121	BTS-120	Balancing
R60	68KΩ	½	B84683	BTS-68K	De-emphasis
R61	5600Ω	½	B84562	BTS-5600	Ratio Det. Diode Load
R62	5600Ω	½	B84562	BTS-5600	Ratio Det. Diode Load
R63	470KΩ 20%	½	B84474	BTS-470K	AVC Network
R64	100KΩ	½	B84104	BTS-100K	AVC Network
R65	10Meg	½	B85106	BTS-10Meg	AF Amp. Grid
R66A	500KΩ	½	† 76X5	BTS-500K	AF Amp. Plate
B	500KΩ	½		BTS-500K	Output Grid
R67	47KΩ	1	B85473	BTS-47K	AF Amp. Plate Decoupling
R68	390Ω	1	C84391	BTA-390	Output Cathode
R69	1000Ω	2	D84102	BTB-1000	Output Decoupling
R70	22KΩ	½	B84223	BTS-22K	Sync. Amp. Cathode
R71	1Meg 20%	½	B85105	BTS-1Meg	Sync. Amp. Grid
R72	12KΩ	½	B84123	BTS-12K	Sync. Amp. Plate
R73	2300Ω	½	B84232	BTS-2300	Sync. Seperator Cathode
R74	47KΩ	½	B84473	BTS-47K	Sync. Seperator Cathode
R75	820KΩ	½	B84824	BTS-820K	Sync. Seperator Plate
R76	3300Ω 5%	½	B83332	BTS-3300 5%	Sync. Phase Inverter Cathode
R77	3300Ω 5%	½	B84332	BTS-3300 5%	Sync. Phase Inverter Plate
R78	3300Ω 5%	½	B83332	BTS-3300 5%	Sync. Phase Inverter Plate
R79A	22KΩ	½		BTS-22K	Integrator Network
B	76X6			BTS-8200	Integrator Network
C	8200Ω			BTS-8200	Integrator Network
R80	470KΩ 20%	½	B85474	BTS-470K	Transformer Shunt
R81	1.5Meg	½	B84155	BTS-1.5Meg	Vert. Osc. Grid
R82	1.5Meg	½	B84155	BTS-1.5Meg	Vert. Osc. Plate
R83	2.2Meg	½	B84225	BTS-2.2Meg	Voltage Divider
R84	180KΩ	½	B84184	BTS-180K	Voltage Divider
R85	4700Ω	½	B84472	BTS-4700	Vert. Peaking
R86	1.8Meg 20%	½	B84185	BTS-1.8Meg	Vert. Output Grid.
R87	820Ω	½	B84821	BTS-820	Vert. Output Cathode
R88	100KΩ	½	B84104	BTS-100K	Horiz. Phase Det. Diode Load
R89	100KΩ	½	B84104	BTS-100K	Horiz. Phase Det. Diode Load
R90	4.7Meg 20%	½	B85475	BTS-4.7Meg	Horiz. Phase Det. Diode Load
R91	470KΩ 20%	½	B85474	BTS-470K	Horiz. AFC Filter
R92	27KΩ	1	B84273	BTS-27K	Horiz. AFC Feedback
R93	15KΩ	1	C84153	BTA-15K	Horiz. AFC Feedback
R94	33KΩ	½	B84333	BTS-33K	Horiz. MV Grid
R95	82KΩ	½	B84823	BTS-82K	Horiz. MV Grid
R96	1500Ω	½	B84122	BTS-1500	Horiz. MV Cathode - See Note 1
R97	5600Ω	½	B84562	BTS-5600	Horiz. MV Plate
R98	180KΩ	½	B84184	BTS-180K	Horiz. MV Plate
R99	10KΩ	½	B84103	BTS-10K	Horiz. Peaking
R100	470KΩ	½	B84473	BTS-470K	Horiz. MV Plate Decoupling
R101	6800Ω	5	43X266	1 3/4A-7000	Decoupling - Wire Wound
R102	470KΩ	½	B84474	BTS-470K	Bleeder
R103	470KΩ	½	B84474	BTS-470K	Bleeder
R104	1Meg	½	B84105	BTS-1Meg	Horiz. Output Grid
R105	150Ω	5	43X363	1 3/4A-150	Horiz. Output Cathode - Wire Wound
R106	1500Ω	½	B84151		Parasitic Suppressor
R107	4500Ω	15	43X268	2D-4500	Horiz. Output Screen - Wire Wound See Note 2
R108	5.1Ω	4	43X239		HV Rectifier Filament - Wire Wound
R109	1Meg	½	C85106		HV Filter
R110	68KΩ	½	B84683	BTS-68K	Tone Compensation
R111	500Ω	10	43X245	1 3/4A-500	Filter - Wire Wound See Note 3
R112	1500Ω	15	43X261	1 3/4A-1500	Filter - Wire Wound
R113	500Ω	10	43X245	1 3/4A-500	Filter - Wire Wound
R114	10KΩ	5	43X247	1 3/4A-10K	Bleeder - Wire Wound

Note 1. Some Models use a 1200Ω Resistor in this application
Note 2. Model 415WG-3049A uses a 7500Ω Resistor in this application
Note 3. Model 415WG-3049A uses a 1000Ω Resistor in this application
† Items R66A, R66B, C63A, C63B, C63C are combined in one unit
◆ Items R79A, R79B, R79C, C68A, C68B, C68C are combined in one unit

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @2.2A	760VCT @.250ADC	5VAC @3.0A	6.3VAC @8.5A SEC 4 6.3VAC @1.2A	53X318	P-8169	P-3059	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	200Ω	1100Ω	54X7	A-8111 ①	A-3000 ①	TB0-2 ②	Vert. Oscillator Trans.
T3	190Ω Tapped @12Ω	10.8Ω Tapped @.4Ω 3Ω &5Ω SEC. 2 6Ω SEC. 3 0Ω					Horiz. Output Trans.
T4	1060Ω Tapped @12Ω		51X151	A-8123	A-3037	TS0-5 ①	Vert. Output Trans.
T5A	20Ω		9A2221	DY-9	MDF-70		Horiz. Deflection Coils
B	50Ω		9A2194 ③				Vert. Deflection Coils
T6			9A2220 ④				Focus Coil

① Drill One New Mounting Hole
② Mount on Top of Chassis
③ Alternate Deflection Yoke
④ Used only in Model 15W6-3049A

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	5.5KΩ	3.5Ω	465Ω	.9Ω	51X150A	A-3877	A-2930	RO-302	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	PM	3.5Ω	12A502	12J12	12A4A	
	CONE DIA.	V. C. DIA.				
SP1B	12"	1"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.250ADC	52Ω	2 Henries	52X88	C-2326	C-2991	TR-3300 ①	① Drill One New Mounting Hole

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No.	MERIT PART No.	NOTES
L2	Ant. Coil	0Ω		9A2119		Channel 2
L3	Fil. Choke	0Ω				
L4	RF Choke	0.				
L5	RF, Mixer Grid & Osc. Coils	0Ω		9A2131		Channel 2
L6	Fil. Choke	0Ω				
L7	1st. Video IF	.8Ω		31A-095		
L8	Fil. Choke	0Ω		9A2033		
L9	2nd. Video IF	.2Ω		9A2225	TV-103	
L10	Fil. Choke	0Ω		9A2033		
L11	3rd. Video IF	.2Ω		9A2225	TV-102	
L12	Fil. Choke	0Ω		9A2033		
L13	Plate Choke	2.4Ω		9A1979		
L14	4th. Video IF	.5Ω		9A2226		Includes Trap
L15	Peaking Coil	10Ω		36A1	TV-181	100 Microhenries
L16	Peaking Coil	31Ω		36A5		750 Microhenries
L17	Peaking Coil	13Ω		36A7	TV-184 †	190 Microhenries, wound on 22KΩ Resistor
L18	Peaking Coil	14Ω		36A4	TV-184 #	215 Microhenries, wound on 2.2KΩ Resistor
L19	4.5MC Trap	.2Ω		9A2074	TV-151	
L20	Peaking Coil	13.5Ω		36A8	TV-184 ♦	185 Microhenries, wound on 47KΩ Resistor
L21	Peaking Coil	13.6Ω		36A2	TV-184	190 Microhenries
L22	1st. Sound IF	2.2Ω		9A2168		
L23	2nd. Sound IF	2.4Ω	2.4Ω	9A2170		
L24	Ratio Det. Trans.	2.8Ω	.4Ω	9A2171	TV-110 *	Tap at .8Ω * Drill one new mounting hole.
L25	Horiz. Osc.	44Ω		9A2096	TV-163	
L26	Width Coil	.2Ω		9A2183		Tap at .5Ω
L27	Horiz. Lin.	1.5Ω		9A2172		

Parallel with 2.2KΩ Resistor
† Parallel with 22KΩ Resistor
♦ Parallel with 47KΩ Resistor

FUSES

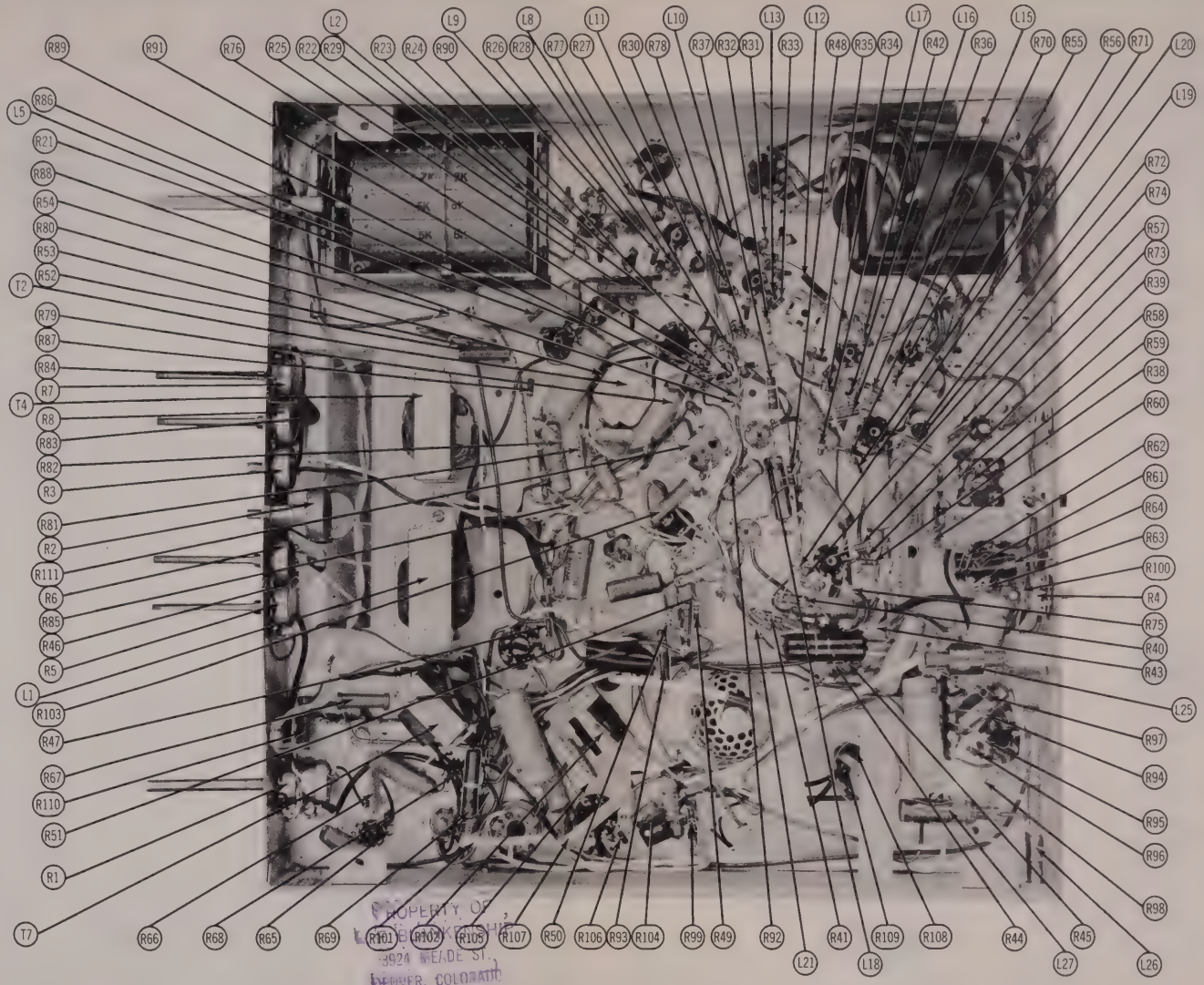
ITEM No.	TYPE	RATING	REPLACEMENT DATA AIRLINE PART No. FUSE	REPLACEMENT DATA AIRLINE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	REMARKS
M1	3AG Slo-Blo	1/4A 250V	16X147	16X146	313.250	357001	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA AIRLINE PART No.		NOTES
M2	Bayonet	7.5	.2	White	7A32		Type No. 51 (Pilot Light)
M3	Bayonet	7.5	.2	White	7A230		Type No. 51 (Jewel Light)

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M4	RF Tuner		
M5	Switch	2A402	TV - Phono
M6	Focus Magnet		
M7	Ion Trap	2A401	
	Knob	10A778	Channel Selector
	Knob	10A785	Fine Tuning
	Knob	10A786	Contrast
	Knob	10A779	Off/On Volume



PROPERTY OF
3924 WEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

BRUSH MODELS BK-437,
BK-437S, BK-439, BK-441, BK-442, BK-443P

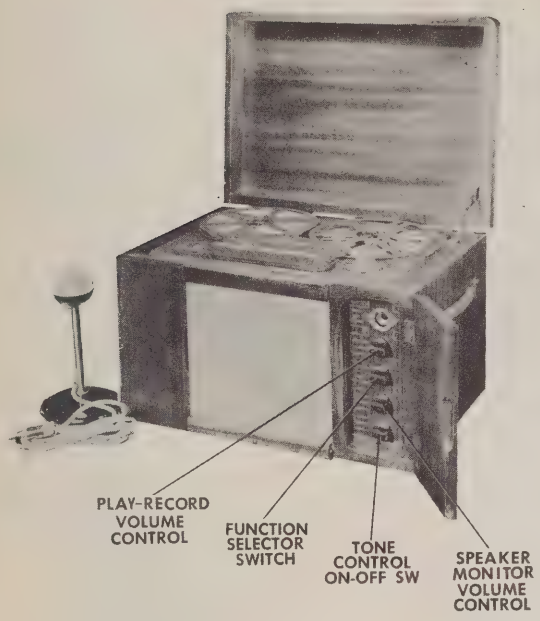


Fig. 1 Model BK-442

Fig. 2 Model BK-443-P

GENERAL INFORMATION

The new series Brush "Soundmirrors" of which the BK-442 table unit and the BK-443P portable are the most important in this line are designed to magnetically record and play back on standard 5" or 7" reel, .248" width recording tape. The principal distinguishing characteristic of the new series is a rotary knob control used on the mechanical chassis in place of the lever control. A small diameter capstan attached to a pulley and a balanced flywheel provide a constant drive speed for the tape; i.e., when the tape is pressed against the capstan by the pressure wheel while the mechanism is in the Record and Play position.

The recorder mechanism incorporates two manual controls and one automatic control.

1. One manual control (mechanism control knob) is used for the purpose of moving the mechanism to the Play or Record, Rewind, Stop, and Fast Forward position.

3. The automatic control consists of micro-switch and arm which operates in Play and Record position only. When all the tape has been wound onto the take-up reel during Record or Playback, the micro-switch arm passes through the slot in the tape guide due to no tape present, thus removing power to the motor.

A number of variations of the BK-443 table unit and the BK-443P portable are "-1" (50 cycle) units and the "S" units operating at one half the tape speed. A number of mechanical chassis, designated by the number BK-437 or BK-437S are precisely the same as on the mechanical sections of the complete machines. Also other machines of this series under model number BK-439 and BK-441 are table models which vary from the BK-442 only in the combination of speaker and output transformer.

Manufactured by:
The Brush Development Company
3405 Perkins Avenue
Cleveland 14, Ohio

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

COPYRIGHT 1952 • ALL RIGHTS RESERVED

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER COLORADO

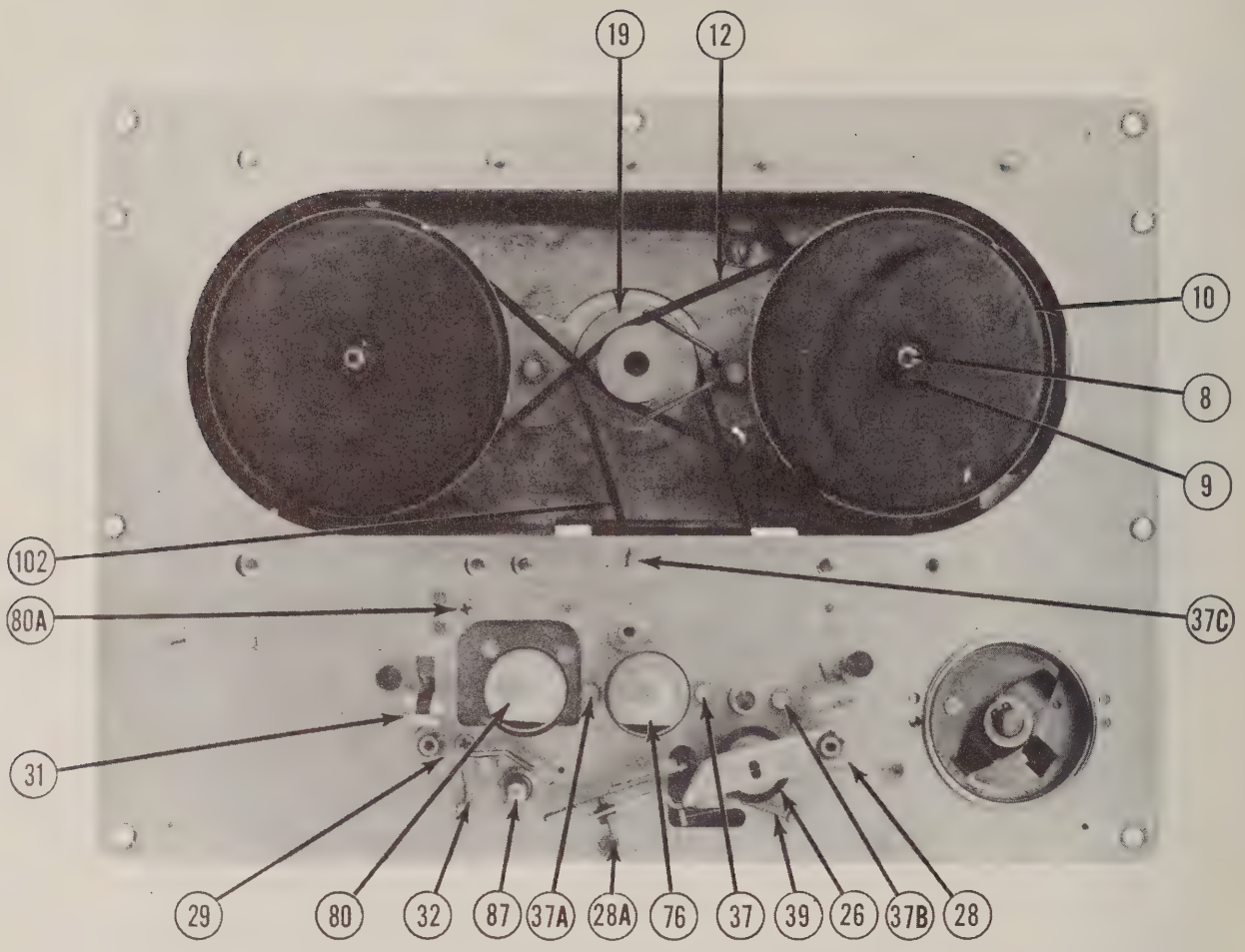


Fig. 3 Top View - Less Cover Assemblies

OPERATING INSTRUCTIONS

Threading the Tape -

1. Place a full reel of tape on the supply reel turntable (left hand spindle) so that the reel will turn counter-clockwise when the tape is pulled from the reel.

NOTE: The Brush Soundmirror requires tape with Type "A" winding, i. e. the dull magnetic coated side of the tape faces inward on the reel. In case the dull side faces outward on the reel (Type "B" wound) it can be changed for use on the Soundmirror by winding the tape with a half twist. The two types "A" and "B" are identical except in which they are wound on the reel.

2. Place an empty reel on the take-up or right hand spindle. Make sure that one of the reel slots of each reel engages the pin on the spindles.

3. Pull about 18" of tape from the feed reel and drop the tape into the tape slot between the two trim covers (2) and (2A).

4. Attach the end of the tape to the take-up reel by threading it through the side of the reel and through one of the radial slots; then hold the end of the tape and turn the reel counterclockwise until the tape is taut.

To Record from Microphone -

1. Insert the power cord plug into a convenient receptacle of the proper rating.

2. Thread the tape on the recorder as described under Threading the Tape.

3. Turn the Tone Control-On-Off switch On.

4. Turn the Record-Play selector switch to Record Mic.

NOTE: On table models the selector switch is a three position switch: Play, Record-Microphone and Record-Radio. On portable models there are two position: Play and Record, the latter being universal.

5. Set the Play or Record Volume Control and the Monitor Volume Control (Speaker Volume) to minimum volume.

6. Insert the Mike plug in the Mike Jack.

NOTE: The Mike Jack for table models is located in the backside of the cabinet. On portable

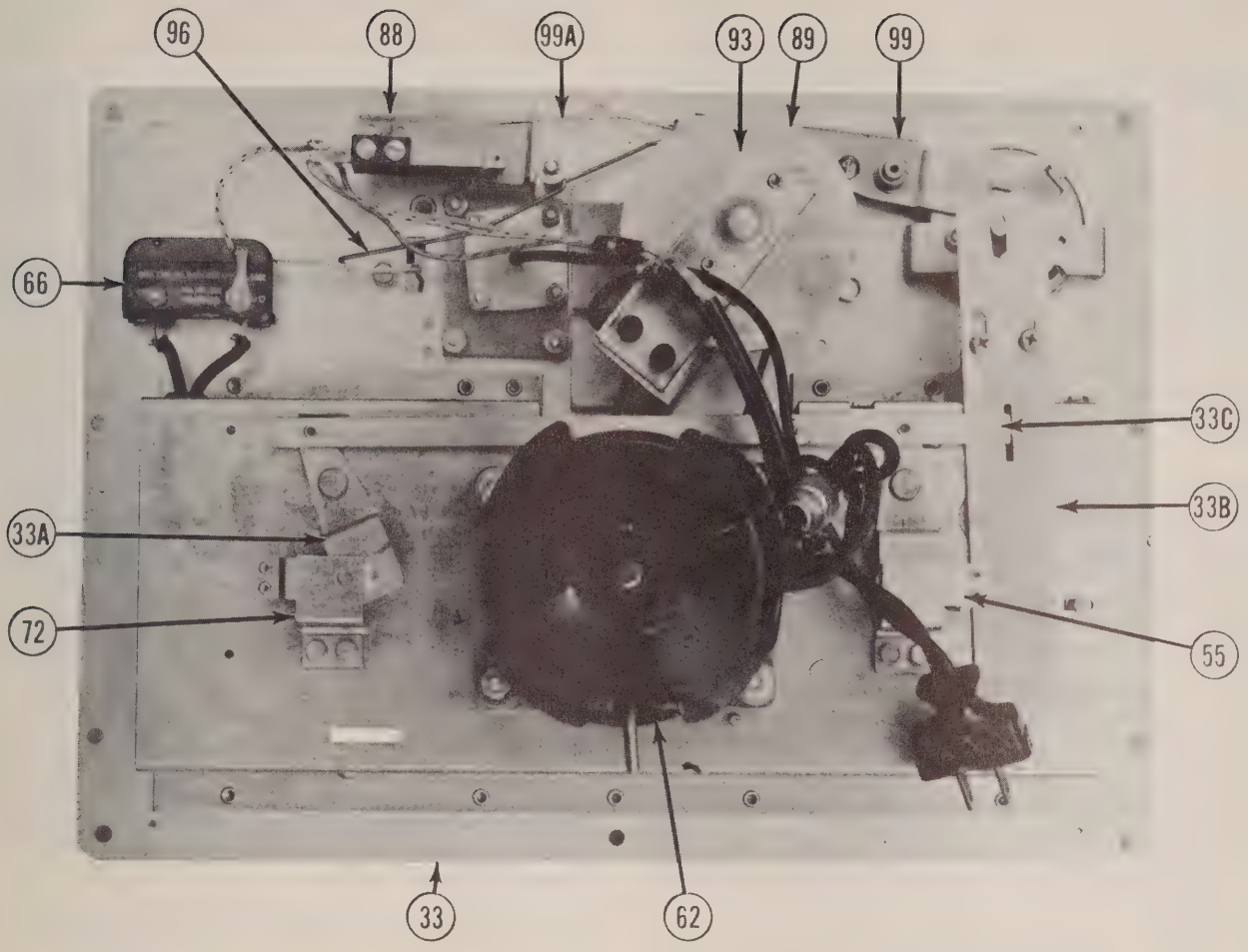


Fig. 4 Bottom View

models the Mike Jack is located on the sloping panel of the carrying case.

7. Push down on the tape control knob (5) and turn to position 3, after first depressing the erase button (87) and hold the erase button in this position until control engages.

8. Turn the Play-Record Volume Control clockwise until the incoming signal causes the Recording Volume Indicator to almost close on high peaks only.

NOTE: Correct recording volume is very important. Too weak a signal, which does not cause the Indicator "Magic Eye" to not quite close, will result in weak playback and high background noise. Too strong a signal, causing the "Magic Eye" to overlap, will result in distortion during playback.

A recording is now being made and any sound entering the mike will be recorded on the tape.

9. The tape may be stopped manually at any time by moving the control (5) to the Off position, No. 1. While the control is in this position the tape will not move in either direction.

10. If no tape is present, i. e. when all the tape has been wound onto the take-up reel with the control (5) in the Play or Record position No. 3, the microswitch arm (66) is allowed to pass through the slot in the tape guide (31), thereby removing the power to the motor, stopping the recorder.

CAUTION: If the control mechanism is left engaged in the Play or Record position for a long period of time, after the automatic shut-off takes place a flat or "detent" may form on the pressure roller (26) resulting in "Wow" or thumping noise when the Soundmirror is used again. Therefore, to prevent this condition, turn the mechanism control to the Off or No. 1 position as soon as possible after shut-off takes place.

NOTE: The automatic shut-off is for the motor and not the amplifier which has to be turned off at the Tone Control Power Off knob.

In fast forward and fast rewind the automatic shut-off is inoperative and the motor will run with or without tape.

To Record From Radio -

1. Recordings can be made from a radio by standing the microphone in front of the radio speaker, however, a recording made this way may be unsatis-

factory since room noise and speaker distortion will enter in.

2. Better quality recordings are made by attaching wires to the voice coil terminals of the radio speaker and connecting these wires by means of a plug to the Radio Input Jack of the Soundmirror.

3. Highest quality recordings are obtained by taking the signal from the internal circuits of the radio at a point ahead of the volume control. This kind of connection may be desirable in some cases, because any circuit deficiencies in the amplifier of the radio will not be included in the recording.

4. Set the controls on the Soundmirror in the same manner as described under "To Record from Microphone."

5. Recordings being made from a radio as in steps 2 and 3 may be heard at the same time through the speaker of the Soundmirror by the use of the Monitor (Speaker Volume Control). With the Monitor Volume Control turned to the left, gradually increase the volume by turning it to the right. The Play or Record Volume Control limits the top volume obtainable from the Monitor Volume Control.

6. Microphone recordings may also be Monitored, however, care should be taken not to set the level too high as Acoustics "feed back" sets in.

Fast Rewind and Fast Forward -

1. The fast forward and fast rewind positions are used principally to find a particular recording on the tape.

2. For fast forward turn the control (5) to No. 3 position. For fast rewind turn the control to No. 2 position. Do not press down on the control knob when turning the control knob to fast forward and fast rewind.

To Play a Recording -

1. Thread the tape on the Soundmirror as described under Threading The Tape.

2. If a reel of tape on the recorder has been recorded and is to be played back, rewind the tape to the start of the recording.

3. Turn the Tone Control Power switch "On".

4. Rotate the Play-Record selector switch to the Play position.

5. Press down on the mechanism control (5) and turn to No. 3.

6. Adjust the Volume and Tone Control to suit.

To Operate the "Soundmirror" as a P. A. System -

1. Insert the Microphone plug into the Mike Input Jack.

2. Turn the Tone Control-Power Off knob on.

3. Turn the Record-Play knob to "Record Mike."

4. Push down on the erase switch pin (87) and turn the Play and Record Volume Control to the right, until the incoming signal through the microphone causes the "Magic Eye" to almost close.

5. With the Monitor Volume Control (Speaker Volume) turned completely to the right, gradually increase the volume by turning it to the right, being careful not to set the level so high that Acoustic "feed back" sets in.

NOTE: The Play or Record Volume Control, limits the top volume obtainable from the Monitor Volume Control.

To Edit and Splice Tape -

In case the tape is broken accidentally, or it is desired to edit the recordings or to insert a length of tape of recorded material from another reel, a splice may be made with Scotch Tape. It is suggested that colored Scotch Tape be used to mark the tape to show the desired divisions or passages. Do not use medicated adhesive tape as it is not suited to this purpose. The Scotch Tape should be applied to the reverse, or uncoated, side of the tape. The edges of the Scotch Tape should be trimmed even with the recording tape.

Erasing Recorded Material -

Erasing of recorded material takes place automatically when new material is recorded; therefore, no special step is necessary to erase old recordings before new recordings are made. However, if a portion of a recording or an entire reel of tape is to be erased, do so as follows:

1. Rewind the tape to the start of the recording to be erased.

2. Turn the Play-Record knob to Record.

3. Turn the Play-Record Volume Control and Monitor Volume Control to O volume.

4. Push down on the erase pin (87), then push down on the mechanism control knob (5) and turn to 3. The recorded material will now be completely erased.

MECHANICAL FUNCTIONS

Drive Mechanism -

The drive mechanism includes the following:

1. A single motor (82) which drives both the capstan and pulley assembly (89) and the reeling mechanism. It is an induction-type motor and is resiliently mounted on a bracket which can be shifted in its position for the purpose of adjusting the tension of the rubber drive belts. A fan is attached to the drive motor shaft to cool the motor.

2. Rubber belts (12) and (102) couple the drive pulley (19), which is fastened to the motor shaft, to the capstan assembly and the reeling mechanism. The smaller belt (102) drives the capstan and the larger belt (12) drives the reels.

3. The small diameter capstan attached to a pulley and a balanced flywheel provide constant drive speed for the ribbon. The capstan revolves in two

bearings, which are of the "Oilite" type and require no additional lubrication. The bottom bearing is of the self-aligning type.

4. The pressure wheel (26) and the Record-Playback pressure pad are assembled on the bracket (28). When the control knob (5) is depressed and turned to position 3, the pressure wheel bracket is actuated causing the pressure wheel and record head pressure pad to press the tape against the capstan and record head. As the pressure arm (28) moves inward it engages the erase head pressure pad assembly, which holds the tape in firm contact with the erase head (80). This operation drives the tape at a fixed linear speed.

Reeling Mechanism -

Cemented to the top surface of the pulleys (11A) are felt pads which are capable of engaging the lower surface of the associated clutch cups (11) with the action of a light friction clutch. The reel drive cups (10) which is called the turntables, are held in engagement with the clutch cup (11) by a "Truarc" retaining ring (9) which is fastened to the reel post (11B). The direction of rotation of the pulleys is such that each turntable, when resting on its pulleys, tends to reel in tape. A pair of cams (33A) figure 3, are provided, one under each reel shaft, mounted and adjusted so that they can be used to lift the associated turntable free of its pulley. Two small felt pads which are mounted on springs on the pulley face (11A) remain in contact with the clutch cup (11) when it is elevated, and in turn offers a slight amount of reverse drive torque when the tape is being pulled from a reel. This action provides back tension to the tape and insures that the tape is wound tightly in fast forward and fast reverse.

Control Mechanism -

When the mechanism control knob (5) is turned to either position 2 or 3 the following action takes place. See figure 3.

1. The clutch lever (33B) is pivoted to the left or right, depending on the direction the knob (5) has been turned, causing the switch actuating bracket (43) to actuate the toggle switch (40) thus supplying power to the motor. At the same time, the cam link (33C), actuated by the clutch lever (33B), pivots the turntable lifter cams (33A). One cam is moved from under the reel pin allowing the turntable to stay engaged with the clutch (11A) causing the tape to wind. While the other cam engages the flat spring on the clutch lifter bracket which in turn applies upward force to the lifter pin (69) thereby raising the turntable to allow the reel to turn freely for the tape to wind on opposite reel.

2. When the control is turned to position 1, the clutch lever is centered, opening the motor switch and allowing both turntables to engage their clutches. This acts as a brake to halt the motion of the tape.

3. When the control knob (5) is depressed and turned to the Play-Record position 3, it rotates the control arm (99) and locks into position. The spring (99A) extending from the control arm (99) applies pressure against the erase pin providing a jam proof arrangement for depressing the erase pin (87) (for recording) either before or after the motion of the arm takes place. The micro-switch actuator, also pivoted by the control arm (99), releases the micro-switch arm (66) for operation. If no tape is present, the micro-switch arm passes through the slot in the tape guide (31), and the motor will not run. In fast forward and rewind this automatic shut-off is inoperative due to the position of the control arm (99) and switch actuator (96). The pressure wheel assembly also actuated by the control arm (99) causes the pressure wheel (26) to press the tape against the capstan spindle, causing the tape to be driven at constant speed. The function of the clutch lever (33B) when the control knob is in this position, is the same as described in step 1, except the lever is pivoted clockwise only. This raises the feed reel turntable and allows the take-up turntable to stay engaged with its clutch so as to wind the tape.

DISASSEMBLY OF PORTABLE MODEL SOUNDMIRROR

To Remove Sub Assembly From Case -

1. Remove the tape reels from the recorder.

2. Remove the two small trim covers (2) and (2A).

3. Remove the four screw holding the cover panel (6) in place, then the cover panel.

4. Remove the three screws at the rear of the mechanical chassis.

5. Remove the two screws holding the handle to the carrying case.

6. Lift the assembly out of the case slightly and disconnect the power supply and speaker plug. Then remove the main sub assemblies.

   (a) This exposes the power supply which is attached to the case, and the speaker assembly.

7. Disconnect the erase head plug, the record head plug, and the motor plug.

8. Remove the four 8-32 flat head screws located on each side of the mechanism.

9. Remove the two 10-32 screws located on the front corners of the mechanism.

10. Remove the mechanism by sliding it away from the amplifier.

To Remove the Amplifier -

1. Remove the four screws on the front control panel.

To reassemble the unit the exact reverse is done carefully when attaching the mechanism so that the projecting edge of the front control panel goes between the erase spring acutator and the main chassis of the mechanism.

DISASSEMBLY OF TABLE MODEL SOUNDMIRROR

To Remove Amplifier From Cabinet -

1. Remove the four control knobs located on the front panel.

2. Disconnect the Soundmirror from the power source.

3. Remove the cardboard back from the cabinet.

4. Disconnect the record head plug, speaker plug, erase head plug, motor plug, and remove the microphone and radio jacks from the output jack board.

5. Remove the pilot light holder from its mounting.

6. Remove the screws which hold the amplifier to the bottom of the cabinet, then slide the amplifier out of the rear of the cabinet.

To Remove the Mechanical Chassis From the Cabinet -

1. Follow steps 2, 3 and 4 as described above, with the exception of jacks.

2. Remove the reels.

3. Remove the two small trim covers (2 and 2A) held in place by three knurled thumb screws.

4. Remove the four binding head screws (4), then the main trim cover (6).

5. Remove the four screws which mount the mechanical chassis to the cabinet and lift the chassis from the cabinet.

To Remove the Speaker -

1. Remove the mechanical chassis and amplifier.

2. Remove the speaker output jack from the jack out-put board.

3. Remove the four screws which mount the speaker to the grille board and lift the speaker out of the cabinet.

REPLACEMENT AND ADJUSTMENTS OF THE MECHANICAL CHASSIS

Replacement of Pressure Wheel Assembly -

The pressure wheel assembly consists of the bracket (28), spring (27), shaft, pressure wheel (26), and the pressure pad which is attached to the bracket. To replace the complete assembly: See figure 2.

1. Remove the "Truarc" retaining ring (24).

2. Lift the assembly off the post, being careful not to damage the spring (27).

3. Slide the spring out the end of the bracket. The wheel and shaft will come out easily.

4. Replace the parts in reverse sequence.

Adjustment of Roller Pressure -

The amount of pressure of the wheel (26) against the ribbon and the capstan spindle is adjusted at the factory. It is not recommended that any adjustment be attempted, but that the defective part be replaced.

If the tape tends to crawl up or down on the capstan spindle, it may indicate that the spring (27) is not properly seated in the groove of the wheel shaft. If this is not the cause, then the spring (27) may have been bent in a manner causing more pressure from one arm than the other. Since this is a critical adjustment it is recommended the spring be replaced rather than adjusted.

To replace the spring (27) see "Replacement of Pressure Wheel Assembly."

Replacement of Pressure Pad -

When it becomes necessary to replace the pressure pads (which have been worn down by the friction set up between the pads and tape), remove the old pads and all the foreign material to where the pads are cemented. Use a quick drying cement and position the pads in their respective location. Care should be taken to prevent any cement from getting on the felt which contacts the tape. After the pads have been replaced, adjust the tape tension as described under "Adjustment of Tape Tension."

Adjustment of Tape Tension -

The tape tension is measured by attaching a spring balance to the end of a piece of tape drawn only through the erase head; then through the record head. The tension required to move the tape through the erase head should be from 1 to 1-1/2 oz.

The pressure of the tape against the erase head (80) can be adjusted by bending the spring located on the erase arm assembly (29).

The pressure of the tape against the record head (76) can be adjusted by loosening the hex nut and turning the screw (28A). See figure 2.

Erase Head Replacement -

1. Remove mechanical chassis from the unit.

2. Remove the three "Philips" flat head screws (80A) which secure the mounting assembly to the chassis.

   (a) Cut the cord which holds the head cable to the capstan bracket.

3. Remove the mounting plate.

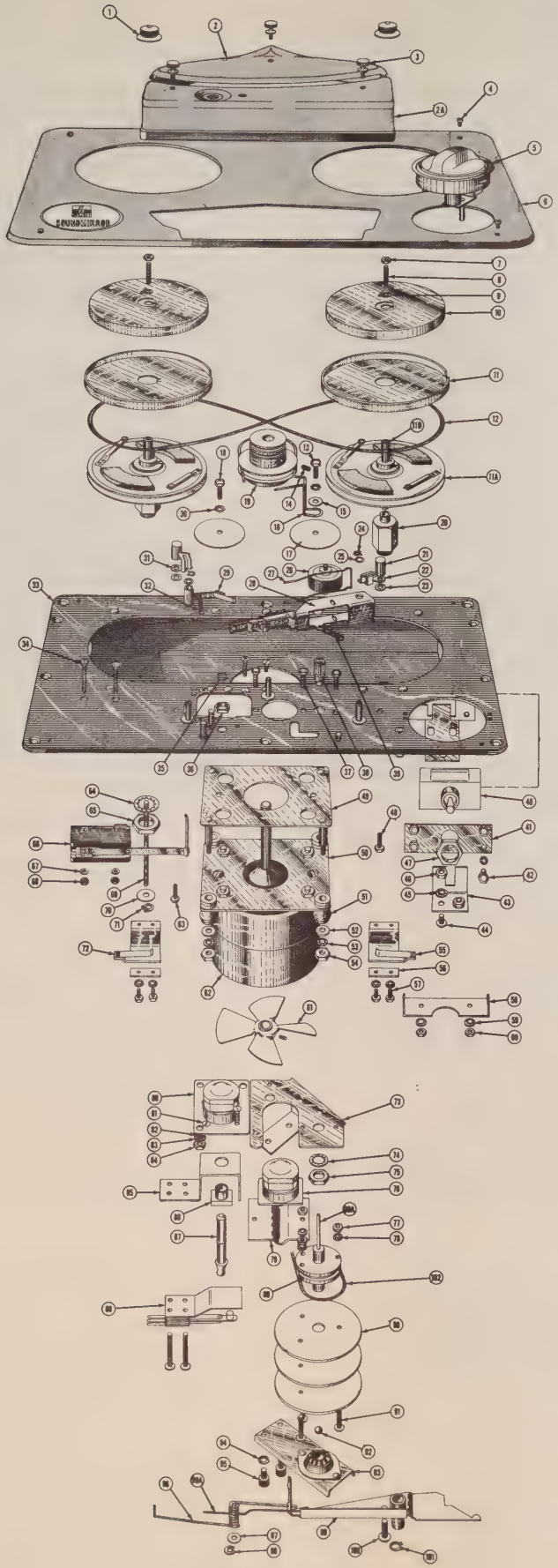
4. Replace the erase head (80) in reverse sequence of steps 1, 2 and 3.

Record-Play Head Replacement - and Adjustment -

1. Remove the mechanical chassis from the unit.

2. Remove the two screws (37 & 37A) which holds the record-play head (76) to the chassis.

3. Unsolder the three wires from the erase switch (88) and cut the cord that holds the head cable to the capstan bracket.



A PHOTOFACT "EXPLODED" VIEW
© Howard W. Sams & Co., Inc. 1952

4. Remove the two remaining screws that hold the capstan drive assembly to the chassis and carefully lower the assembly away from the panel enough to slip the record-play head (76) out the hole.

5. Replace the record head by placing the head (76) and the mounting clamp (79) between the flywheel and the bracket.

6. Hold the assembly in the left hand and position it onto the panel, then tighten the flat head screw (37C), see figure 2. This holds the drive assembly until the other mounting screws are placed in position in the following sequence.

(a) Tighten screw (37B), (37) then (37A) leaving screws (37B) and (37) just loose enough to allow the head to be rotated slightly for adjustment.

7. Replace the mechanical chassis and connections to amplifier.

8. Place a reel of recorded material on the Soundmirror and properly thread it on the machine.

9. Turn the power on and allow the tubes to warm up.

10. Set the amplifier controls for play back operation.

11. Depress the tape control knob (5) and rotate to position 3.

12. While listening to the signal being reproduced by the tape, rotate the head back and forth until the best reproduction is found.

13. Alternately tighten the screws to lock the head in position.

Adjustment of Tape Guides -

1. If for any reason the tape guides (22 & 31) have become loose or removed, remount the guides so that they will be parallel to the path of the tape. To adjust the tape guide the mechanical chassis will have to be removed from the cabinet in order to gain access to their mounting screws.

Replacement of Turntable Assembly -

1. Remove the "Truarc" retaining ring (9).

2. Lift the turntable assembly from the reel post (11B).

3. The turntable assembly is divided into two parts upper cup (10) and lower cup (11). Therefore when replacing this assembly make sure the cups fit together with insides facing each other and that the notches and slots in their edges coincide.

4. Replace the "Truarc" retaining ring making sure it fits into the groove of the reel post.

Removing Clutch Assembly -

1. Remove mechanical chassis.

2. Remove turntable assembly.

3. Remove clutch lifter bracket (55) or (72).

4. Remove drive belt (12).

5. Remove the "Truarc" retaining ring on bottom end of reel post shaft.

6. Lift out the reel post and clutch pulley being careful not to lose the lifter pin.

7. The felt clutch which is cemented to the upper surface of the pulley and is ground flat at time of assembly. Under normal conditions it should not require replacement however, if damaged, the pulley assembly should be replaced.

8. Reassemble in the reverse of the above steps.

Adjustment of Clutches -

The clutches are adjusted by the clutch adjusting screws (8). To check the clutches for proper adjustment:

1. Turn off the power to the Soundmirror.

2. Place a loaded reel of tape on the left hand turntable, then turn the tape control knob (5) to position 3. As this is done the turntable and reel should rise very slightly, not over 1/32 of an inch. If the turntable does not raise this amount or exceeds this dimension, loosen the hex nut (7) and adjust the screw (8) until the condition is corrected.

Make the same adjustment for the take-up turntable with the exception of the control knob which is turned to position 2.

LUBRICATION

The motor should be oiled once every three months with number 20 SAE oil:

All moving or sliding parts should be thoroughly cleaned with carbon tetrachloride to remove all foreign material before lubricating. After cleaning, apply a light coat of light oil.

NOTE: Avoid over lubrication. Wipe off all excessive oil. Do not allow lubricant to come in contact with any drive surfaces and the rubber belts.

The following are oilite type bearings and need very little lubrication.

1. Clutch pulley bearing.
2. Capstan spindle bearing.
3. Pressure wheel bearing.

SOUNDMIRROR VARIATIONS (BK-442, BK-443-P) 50 CYCLES

From the standard line of Soundmirrors there are units furnished capable of operating on 50 cycles, (110, 150, 220, 250) volt.

These models are BK-442-1 and BK-443-P-1 which are identical in construction to the standard models of the BK-442 and BK-443 with the following exceptions:

1. The 50 cycle motor, Part No. 207259.

2. The 50 cycle pulley, Part No. 107248.

3. And the 50 cycle transformer with taps for 110, 150, 220 and 250 volts, Part No. 208369.

NOTE: In order to mount the above transformer these brackets are necessary, Part No. 107621-4 and two brackets Part No. 106665-1.

Slow Speed (1 hour operation) -

These models BK-442-S and BK-443-PS are identical in construction to standard BK-442 and BK-443-P except:

1. Slow speed motor pulley, Part No. 108357.

2. Slow speed capstan, Part No. 209800-501. The amplifier is compensated by:

(a) Shorting C-19 connections:

(b) C-15 and C-13 will be .004 mmf. condenser Part No. 3-106094-5.

(c) C-14 should be 1 mmf. condenser Part No. 2-106094-1.

Combination 50 Cycle Slow Speed-

These units will be designated as BK-442-S-1, BK-443-PS-1 and are combination slow speed 50 cycle units and are identical to the BK-442 and BK-443-P with the following exceptions:

1. 50 cycle motor Part No. 207259.

2. Slow speed motor pulley, 50 cycle Part No. 109786.

3. Slow speed capstan, Part No. 209800-501 Amplifier Compensation:

(a) Shorting C-19 connections.

(b) C-15 and C-13 will be .004 mmf. condenser, Part No. 3-106094-5.

(c) C-14 should be 1 mmf. condenser, Part No. 2-106094-1.

TROUBLES AND REMEDIES

Wow and Flutter -

1. Motor Pulley (19) loose on motor shaft. Tighten.

(a) When tightening motor pulley make sure that the pulley is positioned so that the capstan drive belt (102) runs parallel to the panel.

2. Excessive pressure of pressure pads.

(a) See "Adjustment of Tape Tension."

3. Bent capstan (89A).

(a) Replace capstan drive assembly.

4. Damaged or oily capstan drive belt (102).

(a) Clean belt with naptha, if worn replace belt.

5. Binding motor shaft.

(a) Replace motor (62).

6. Binding reel post bearing.

(a) Clean or replace bearing or reel post.

Failure to Thread Tape -

1. Tape guides out of adjustment.

(a) See "Adjustment of Tape Guides."

2. Loose or broken erase pad return spring (32). Thereby failing to pull the erase arm (29) away from the erase head.

(a) Replace spring (32).

3. Loose or broken return spring (39) on pressure wheel assembly, thereby failing to pull the assembly away from the play-record head.

(a) Replace spring (39).

Tape Fails to Wind on Reel -

1. Clutch out of adjustment.

(a) See "Adjustment of Clutches."

2. Clutch belt slipping.

(a) Clean motor drive pulley with carbon tetrachloride.

(b) Reposition motor to tighten belt. If unsatisfactory, replace belt.

3. Reel pin on reel shaft (11A) broken, allowing reel to slip on turntable.

(a) Replace reel shaft (11A). See "Removing Clutch Assembly."

Poor Frequency Response -

1. Accumulation of tape coating residue on the record-play head.

(a) After the "Soundmirror" has been used for some time, the many thousands of feet of tape passing over the heads may have deposited a film of gum, dust and dirt on the laminations. This film will reduce the efficiency of the recorder. This accumulation of tap coating residue and foreign material should be periodically removed by the use of a small cotton swab on the end of a toothpick and carbon tetrachloride as the cleaner. Be careful not to mar the lamination as they should be smooth to operate properly.

2. Too much or too little bias.

(a) This can be caused by the frequency varying from the desired 40 KC. Check and replace the faulty componet.

3. Defective componet in compensating network. Replace.

No Erase and "Magic Eye" Does not Function -

1. Erase button (87) not depressed.

2. Check the erase switch (88) to see if it is operating properly. Adjust if necessary.

3. Erase spring actuator (99A) bent, thereby not holding the erase pin (87) in record position.

(a) Adjust or replace.

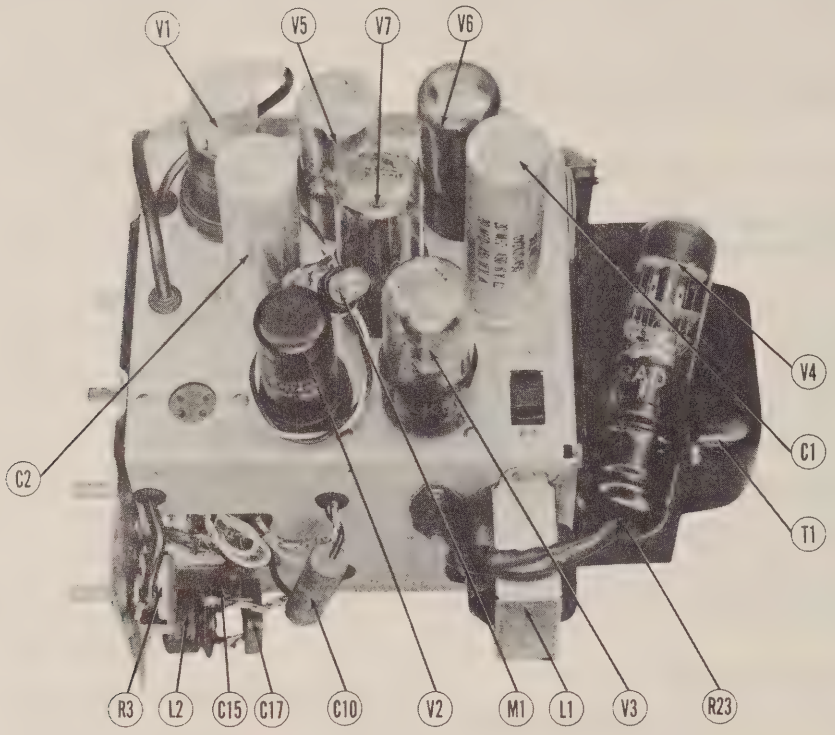


Figure 5 - Top View - Model BK-442

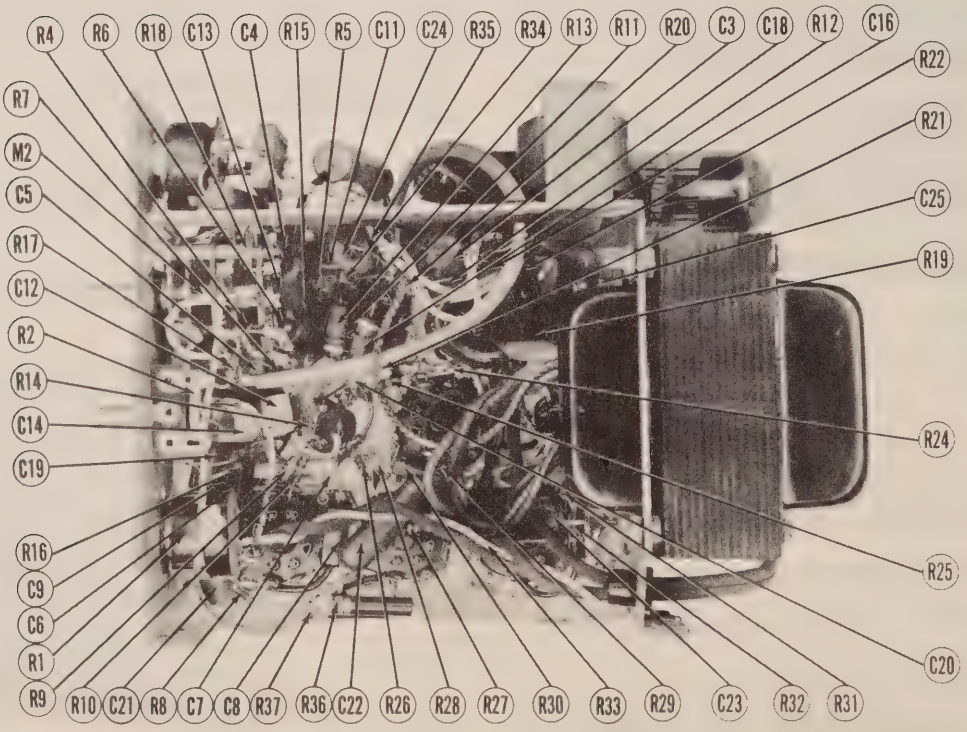
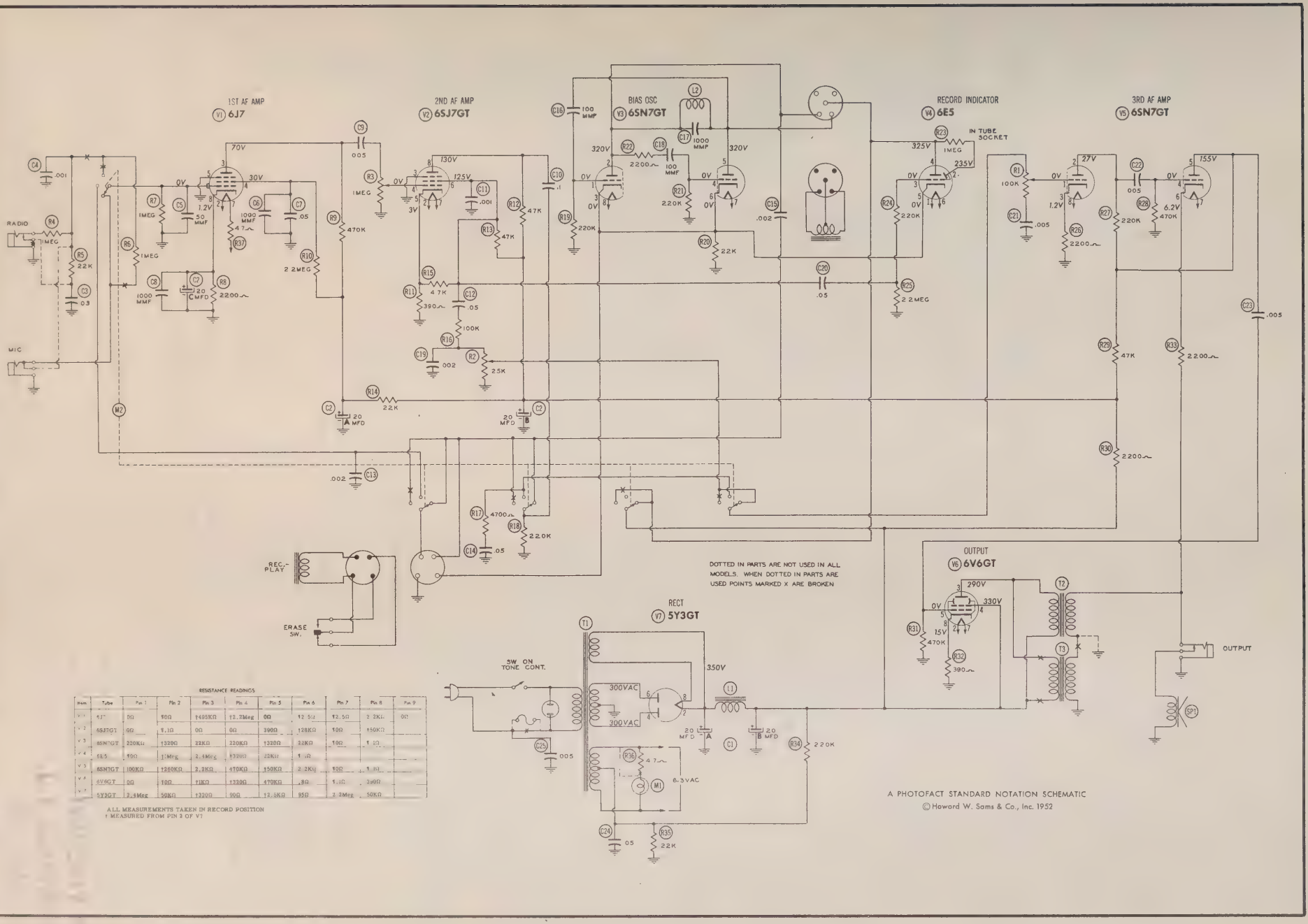


Fig. 6 Bottom View - Model BK-442



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6J7	0Ω	50Ω	†495KΩ	†2.2Meg	0Ω	†2.5Ω	†2.5Ω	2.2KΩ	0Ω
V2	6SJ7GT	0Ω	9.1Ω	0Ω	0Ω	300Ω	128KΩ	10Ω	150KΩ	
V3	6SN7GT	220KΩ	†320Ω	22KΩ	220KΩ	†320Ω	22KΩ	10Ω	1.1Ω	
V4	6E5	10Ω	1Meg	2.4Meg	†320Ω	22KΩ	1.1Ω			
V5	6SN7GT	100KΩ	†260KΩ	2.2KΩ	470KΩ	150KΩ	2.2KΩ	10Ω	1.1Ω	
V6	6V6GT	0Ω	10Ω	†1KΩ	†320Ω	470KΩ	8Ω	1.1Ω	390Ω	
V7	5Y3GT	2.4Meg	50KΩ	†320Ω	90Ω	†2.5KΩ	95Ω	2.2Meg	50KΩ	

ALL MEASUREMENTS TAKEN IN RECORD POSITION
† MEASURED FROM PIN 3 OF V7

Incomplete or No Erase, How ever "Magic Eye" Operates -

1. Erase head (80) dirty.
   (a) Clean, See "Poor Frequency Response" (1-A).
2. Check the 6SN7 (V3), if faulty replace.
3. Faulty componet in (V3) circuit.
4. Faulty erase head (80). Replace.
5. Insufficient pressure on erase head pad.
   (a) Adjust, See "Adjustment of Tape Tension."

Fails to Record, "Magic Eye" Operates -

1. Shorted record head (76). Replace.
2. Faulty wiring to record head.
3. (C10) open. Replace.

Mechanical Parts List Brush

Ref. No.	Part No.	Description
1	107185	Reel Nut Clamp; Antique Bronze
	107185-1	Reel Nut Clamp; Chrome
2	108613-PL1	Head Cover Assembly - Dark
	110326-PL1	Head Cover Assembly - Light
2A	310255-501	Pressure Wheel Cover Assembly - Dark
	310311-501	Pressure Wheel Cover Assembly - Light
	106827-2	Rubber Beading
3		Knurled Thumb Screw; #6-32 X 1/4" Antique Bronze or Chrome
4		#4-40 X 3/16" Slot-Binder Head Machine Screw-Antique Bronze or Chrome
5	110147-501	Control Knob Assembly - Dark
	110312-501	Control Knob Assembly - Light
		104307-10 "Truarc" Retaining Ring # 5100-34; .304" .311" I.D.
		110089 Plain Washer; Control Shaft
		#4-40 X 5/16" Filister Head Machine Screw
		110030 Control Shaft Spring Assembly
		110039 Control Knob Spring
		110061-501 Control Shaft Assembly
6	310254-501	Cover Panel Assembly - Dark
	310208-501	Cover Panel Assembly - Light
7		#8-32 Hex Nut-Small Pattern
8		#8-32 X 5/8" Set Screw-Allen Head Cup Point
9	104307-5	"Truarc" Retaining Ring - Pat. #5100-31; .281" I.D.
10	210055-1	Reel Drive Cup-Reel Support
11	206148	Clutch Cup
11A	107980-501	Pulley Clutch - Sub Assembly
11B	109300-501	Reel Post - Sub Assembly
12	106340	Rubber Belt - Clutch Drive
13		#10-24 X 1/2" "Sems" Hex Head Machine Screw-Type 1" Thread cut ELW
14		#8-32 X 1/4" Set Screw-Cup Point Allen Head
15		#10 Plain Washer
16	207143	Belt Guide
17	106120-1	Washer
18		#10-24 X 3/8"; Sems Head Machine Screw
19	106472	Motor Drive Pulley; one half-hour recorder, 60 Cycles
	108357	Motor Drive Pulley; One hour Recorder 60 Cycles
	107248	Motor Pulley; One half Hour Recorder, 50 Cycles
	109786	Motor Pulley; One Hour Recorder 50 Cycles
20	1-210072-501	Bearing Assembly, Clutch Support
21	106262	Ribbon Guide Post
22	206321	Ribbon Guide; Right Hand
23		Washer, Internal Lock; #8
24	104307-1	"Truarc" Retaining Ring #5100-25; .225" I.D.
25	108566	Shim Washer
26	106125	Pressure Wheel
27	106128	Pressure Wheel Spring
28	210094	Pressure Wheel Bracket
28A		#4-40 X 1/2" R.H.M.S. Hex Nut #4-40
	106454-1	Speed Nut-Tinnerman-C-991 -440; #4-40
28B	106129	Pressure Pad - Record Head
29	110056-501	Erase Head Pressure Arm Assembly
29A	110075	Erase Head Pressure Pad
30		Washer #10 External Lock
31	210043	Ribbon Guide- Left Hand
32	110078	Pressure Wheel Bracket Spring
33	310090-501	Mechanical Chassis Assembly Includes Posts; Clutch Lifter Lever; Clutch Lever
34		#4-40 X 1" Philips F.H.M.S.
35	104307-1	"Truarc" Retaining Ring Cat. #5100-31;281" I.D.
36		3/8 - 32 Hex Nut
37		6-32 X 3/8 Sems Hex Head Machine Screw
37A	106364-501	6-32 X 1/4 Sems Hex Head Machine Screw
38	106364-501	Capstan Spindle Bearing; Sub-Assembly
39	110076	Pressure Arm Spring
40	110111	Toggle Switch
41	110014	Switch Mounting Plate
42		#6 X 1/4" Screw; Thread Cut; Type "1"
43	110032	Switch Actuator Bracket
44		#8-32 X 5/16" Philips R.H.M.S.
45		#8 Internal Lock Washer
46		#8-32 Hex Nut
47		Hex Nut
48		#8-32 X 3/8 Sems Hex H.M.S.
49	106163-501	Motor Shock Mounting Plate

Ref. No.	Part No.	Description
50	106122	Motor Mounting Plate
51	104213-4	Vibration Mount-Rubber
52	106671	Plain Washer .172" I.D. X 1/2" O.D. X .049" Thick
53		#8 Internal Lock Washer
54		#8-32 Hex Nut
55	106407-501	Clutch Lifter Bracket-take-up-side
56	107998	Switch Plate
57		#6-32 X 3/8 Screw-Sems Hex Head Thread Cutting
58	110028	Control Mounting Clamp
59		#4 Internal Lock Washer
60		#4-40 Hex Nut
61		Motor Fan part of item 62
62	206322	Motor, 115 Volts AC. 60 Cycles, Four Pole; Shaded Pole Induction Type; Includes Cooling Fan and Set Screw
	207259	Motor 115 Volt AC 60 Cycle; Shaded Pole Induction Type; Includes Cooling Fan and Set Screw
	206432-501	Motor Assembly, 60 Cycles; Includes 60 Cycle Motor and Motor Mounting Assembly; Motor Mounting Assembly is the same for 50 or 60 Cycle Motor
	107524-PL1	Motor Assembly, 50 Cycle; Includes 50 Cycle Motor and Motor Mounting Assembly; Motor Mounting Assembly is the same for 50 or 60 Cycle Motor
63		#8-32 X 3/8 Sems Hex H.M.S.
64		Internal Lock Washer: 1/2"
65	106157	Hex Nut: 1/2" -20 N.C. 2 Thread
66	110059-501	Switch Assembly, Tape Brake
67		#4 Plain Washer
68		#4-40 Hex Nut
69	106117	Clutch Lifter Pin
70	108605	Washer-Shim
71	104307-6	"Truarc" Retaining Ring #5100 -18; .170" - .164" I.D.
72	210180-501	Clutch Lifter Bracket, Supply Side
73	206139	Capstan Drive Bracket
74		Internal Lock Washer 3/8"
75		Hex Nut
76	310226-501	Record Reproduce Head Assembly; Includes Cable Assembly and connecting Plug.
77		#4-40 Hex Nut
78		#4 Internal Lock Washer
80	110098-501	Erase Head Assembly; Includes Cable Assembly and connecting Plug
81		#4-40 X 3/8" Flat Head Machine Screw
82		#4 Plain Washer
83		#4 Internal Lock Washer
84		#4-40 Hex Nut
85	110029	Erase Switch Bracket
86	106143	Erase Sleeve Pin
87	110016	Erase Switch Actuating Pin
88	110086	Erase Switch; Includes Mounting Screws
89	108189-501	Drive Capstan-Sub Assembly: Includes Shaft and Pulley for one half or one hour Recorder
	206460-501	Capstan Drive Assembly; Includes Spindle, Spindle Bearing, Flywheel, Pulley, Lower Bearing, and Mounting Bracket, one half hour Recorder
	209823-501	Capstan Drive Assembly; Includes Spindle Bearing, Spindle, Flywheel, Pulley, Lower Bearing, and Mounting Bracket, one hour Recorder
	208190-501	Capstan Drive Sub Assembly with Plates for one half hour Recorder
	209800-501	Capstan Drive Sub-Assembly with Plates for one hour Recorder
90	108192	Flywheel Discs, for all types of Recorders
91		#4-40 X 3/4" Philips Head Machine Screw
92	104636-1	Steel Ball, 1/8" Diameter
93	106394-501	Capstan Bracket, Bottom Bearing Assembly
94		#10 Spring Lock Washer
95		#10-32 X 3/8" Socket Head Cap Screw
96	110046	Arm-Switch Disabling
97		#4 Plain Washer
98	104644-2	Retaining Ring, Waldes Kohinoor, Type "E" #5133-12, .094" I.D.
99	110057-501	Control Arm Assembly
99A	110052	Erase Spring Actuator
100		#6-32 X 1/4" Philips Binding Head Machine Screw
101	104307-1	"Truarc" Retaining Ring, #5100-25, .225" I.D.
102	106339	Rubber Belt, Capstan Drive

Electrical Parts List Brush BK-442

Ref. No.	Part No.	Description
V1	7075	6J7, 1st AF Amplifier
V2	105205	6SJ7GT, 2nd AF Amplifier
V3	103185	6SN7GT, Bias Oscillator
V4	105206	6E5, Record Indicator
V5	105205	6SN7GT, 3rd AF Amplifier
V6	102709	6V6GT, Power Output
V7	102705	5Y3GT, Rectifier
C1A	102711	□ Filter, 20 mfd. @ 450 Volts
C1B		Δ Filter, 20 mfd. @ 450 Volts
C2A	103253	□ 1st AF Amp. Decoupling, 20 mfd. @ 450 Volts
C2B		Δ 2nd AF Amp. Decoupling, 20 mfd. @ 450 Volts
C2C		1st AF Amp. Cathode, 20 mfd. @ 25 Volts
C3	3-106093-8	Tone Compensation, .03 mfd. @ 600 Volts
C4	3-106093-3	Tone Compensation, .001 mfd. @ 600 Volts

Ref. No.	Part No.	Description
C5	1-107461-2	1st AF Amp. Grid, 50 mmf. @ 500 Volts
C6	1-106972-5	1st AF Amp. Screen, 1000 mmf. @ 500 Volts
C7	2-106094-2	1st AF Amp. Screen, .05 mfd. @ 400 Volts
C8	1-106972-5	1st AF Amp. Cathode, 1000 mmf. @ 500 Volts
C9	3-106093-4	Audio Coupling, .005 mfd. @ 400 Volts
C10		Audio Coupling, .1 mfd. @ 400 Volts *
C11	3-106093-3	2nd AF Amp. Screen, .001 mfd. @ 400 Volts
C12	2-106094-2	Tone Compensation, .05 mfd. @ 400 Volts
C13	2-106093-6	Tone Compensation, .002 mfd. @ 600 Volts
C14	2-106094-2	Tone Compensation, .05 mfd. @ 400 Volts
C15	2-106093-6	Oscillator Coupling, .002 mfd. @ 600 Volts
C16	1-109354-3	Oscillator Feedback, 1000 mmf. @ 500 Volts
C17	1-106972-5	Fixed Trimmer, 1000 mmf. @ 500 Volts
C18	1-109354-3	Oscillator Feedback, 100 mmf. @ 500 Volts
C19	2-106093-6	Tone Compensation, .002 mfd. @ 600 Volts +
C20	2-106094-2	Audio Coupling, .05 mfd. @ 400 Volts
C21	3-106093-4	Tone Compensation, .005 mfd. @ 600 Volts
C22	3-106093-4	Audio Coupling, .005 mfd. @ 600 Volts
C23	3-106093-4	Audio Coupling, .005 mfd. @ 600 Volts
C24	1-109348-5	Filter Isolation, .05 mfd. @ 400 Volts
C25	106100-6	Line Filter, .005 mfd. @ 600 Volts

* Some Models Use .25 mfd. in this Application, (Part No. 3-106093-7).

\+ Some Models Use .001 mfd. in this Application, (Part No. 3-106093-3).

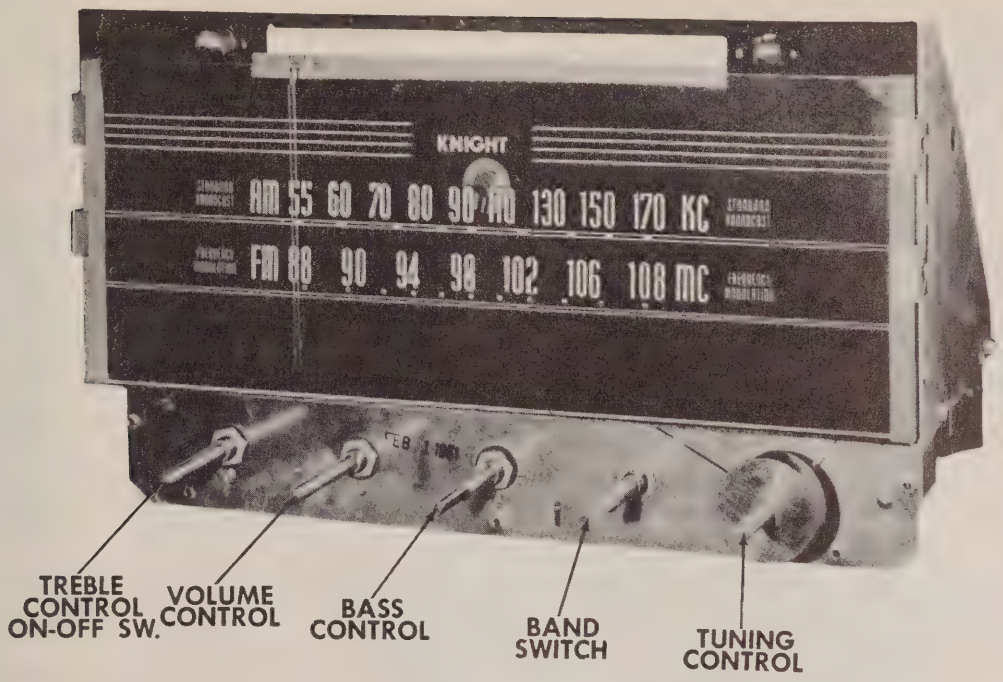
Ref. No.	Part No.	Description
R1	106762-1	Tone Control, 100K ohm 1/2 Watt
R2	103469-2	Speaker Monitor Volume Control 25K ohm 1/2 Watt
R3	103469	Play or Record Volume Control 1 Meg. 1/2 Watt
R4	3-106771-3	Tone Compensation, 1 Meg. 1/2 Watt
R5	3-106771-7	Tone Compensation, 22K ohm 1/2 Watt
R6	3-106771-3	Tone Compensation, 1 Meg. 1/2 Watt
R7	3-106771-3	1st AF Amp. Grid, 1 Meg. 1/2 Watt
R8	3-106771-2	1st AF Amp. Cathode, 2200 ohm 1/2 Watt
R9	1-107989-9	1st AF Amp. Plate, 470K ohm 1/2 Watt
R10	3-106771-8	1st AF Amp. Screen, 2.2 Meg. 1/2 Watt
R11	3-106771-5	2nd AF Amp. Cathode-Wire Wound Wound, 390 ohm 1/2 Watt
R12	2-106772-3	2nd AF Amp. Plate, 47K ohm 1 Watt
R13	2-106772-3	2nd AF Amp. Screen, 47K ohm 1 Watt
R14	3-106771-7	Decoupling, 22K ohm 1/2 Watt
R15	2-106771-10	Voltage Divider, 47K ohm 1/2 Watt
R16	2-106771-12	Tone Compensation, 100K ohm 1/2 Watt - See note 2.
R17	103806-18	Tone Compensation, 4700 ohm 1/2 Watt
R18	3-106771-1	Tone Compensation, 220K ohm 1/2 Watt
R19	3-106771-1	Bias Oscillator Grid, 220K ohm 1/2 Watt
R20	3-106771-7	Bias Oscillator Cathode, 22K ohm 1/2 Watt
R21	3-106771-1	Bias Oscillator Grid, 220K ohm 1/2 Watt
R22	3-106771-2	Isolation, 2200 ohm 1/2 Watt
R23	3-106771-3	Record Indicator Plate, 1 Meg. 1/2 Watt
R24	3-106771-1	Record Indicator Grid, 220K ohm 1/2 Watt
R25	3-106771-8	Indicator Network, 2.2 Meg. 1/2 Watt
R26	3-106771-2	3rd AF Amp. Cathode, 2200 ohm 1/2 Watt
R27	3-106771-1	3rd AF Amp. Plate, 220K ohm 1/2 Watt
R28	103806-12	3rd AF Amp. Grid, 470K ohm 1/2 Watt
R29	2-106772-3	3rd AF Amp. Plate, 47K ohm 1 Watt
R30	3-106772-4	Decoupling, 2200 ohm 1 Watt
R31	103806-12	Output Grid, 470K ohm 1/2 Watt
R32	2-106772-5	Output Cathode, 390 ohm 1 Watt
R33	3-106771-2	Feedback, 2200 ohm 1/2 Watt
R34	3-106771-1	Voltage Divider, 220K ohm 1/2 Watt
R35	3-106771-7	Filament Isolation, 22K ohm 1/2 Watt
R36	1-106005-3	Series Pilot Light-Wire Wound See note 1 & 3.
R37	1-106005-3	1st AF Amp. Filament -Wire Wound - See note 3.

NOTE: 1. Used in Model BK-422 only

2. Some Models use Parallel Resistors in this Application to Obtain Desired Value.

3. Some Models use 5ohm or 5.1 ohm in this application.

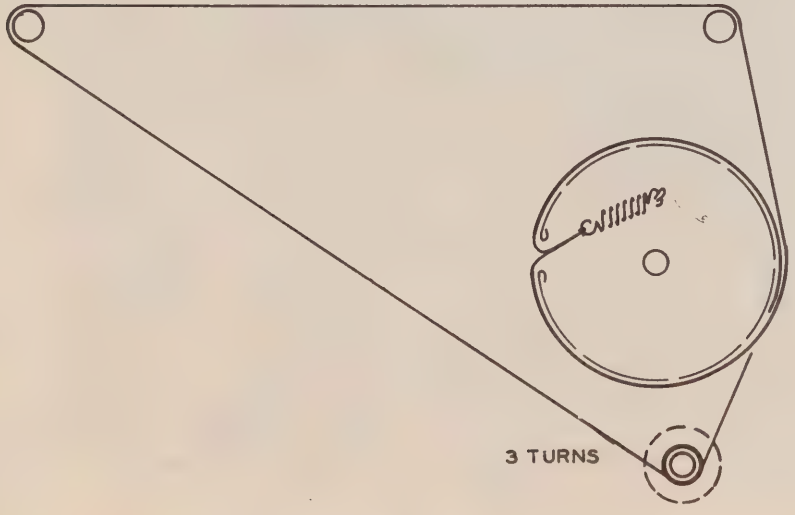
T1	204902	Power Transformer, 117 Volt
T2A	208913	Output Transformer
T2B	200923	Output Transformer
T3	200923	Output Transformer
SP1	305975	8" 3ohm PM Speaker
L1	200925	Filter Choke
L2	103865	Oscillator Coil
M1	105710-1	Dial Light 6-8 Volts Type TS44
M2	106746-3	Selector Switch


KNIGHT
AM 55 60 70 80 90 110 130 150 170 KC
FM 88 90 94 98 102 106 108 MC
TREBLE CONTROL ON-OFF SW.
VOLUME CONTROL
BASS CONTROL
BAND SWITCH
TUNING CONTROL

KNIGHT
MODEL 20H611

TRADE NAME	Knight Model 20H611
SUPPLIER	Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill.
TYPE SET	AC Operated AM-FM Custom Installation Superheterodyne Receiver with Separate Audio Chassis
TUBES (TWENTY)	Types 6BA6 FM RF Amp., 6BE6 FM Mixer, 6C4 FM Osc., 6BA6 AM RF Amp., 6BE6 AM Conv. 6SG7 1st IF Amp., 6SH7 2nd IF Amp., 6AL5 Ratio Det., 6J5 AM Det., 6E5 or 6U5 Tuning Ind., 6SQ7 FM AVC Clamper-AF Amp., 6SL7 Phono Pre Amp., (2) 6J5 AF Amp., (4)6V6GT Audio Output, (2) 5Y3GT Rect.
POWER SUPPLY	110-120 Volts AC — RATING 1.25 Amp. @ 117 Volts AC
TUNING RANGE- BROADCAST	535-1720KC — FREQ. MOD. 88-108MC

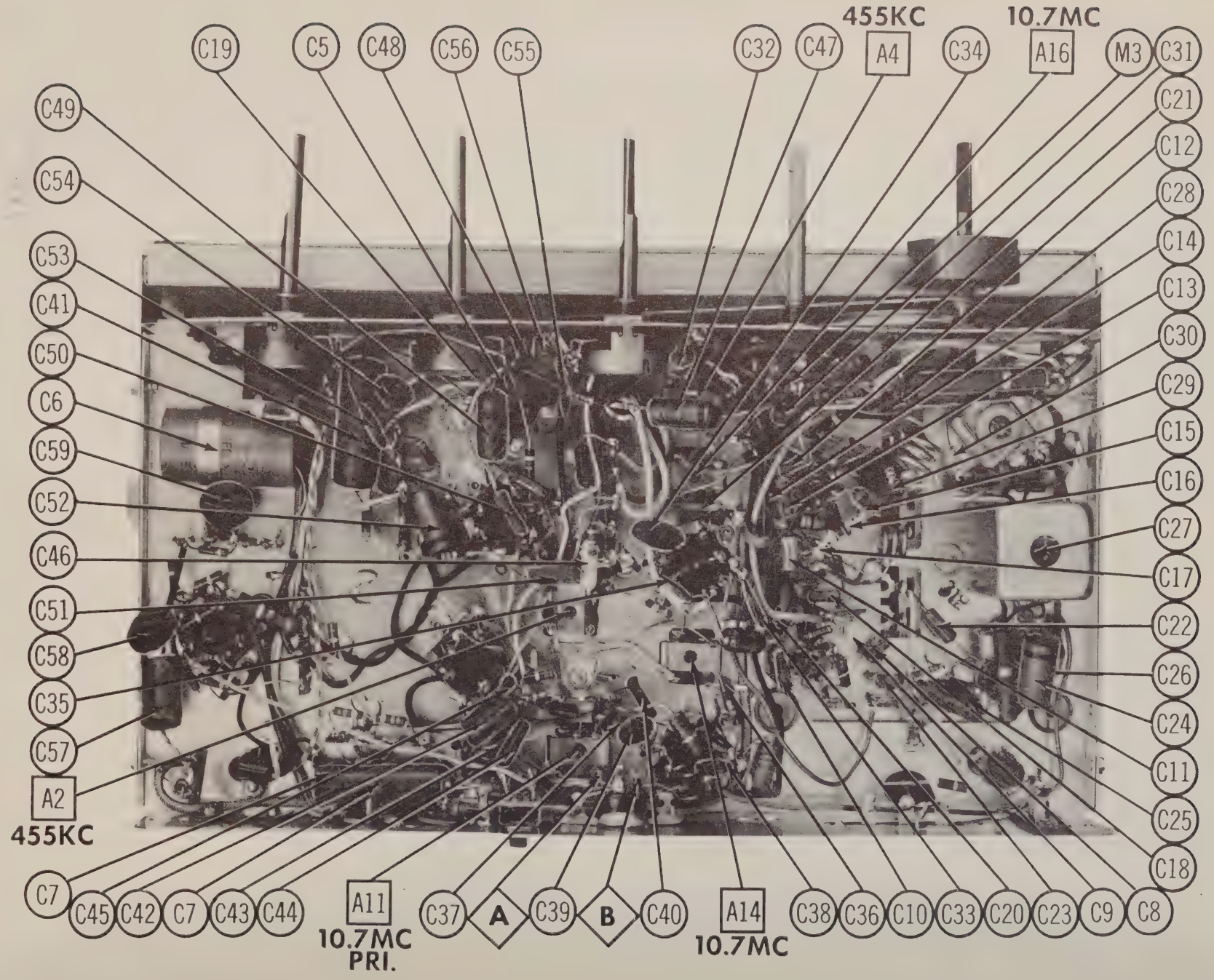
TUNING GANG FULLY CLOSED

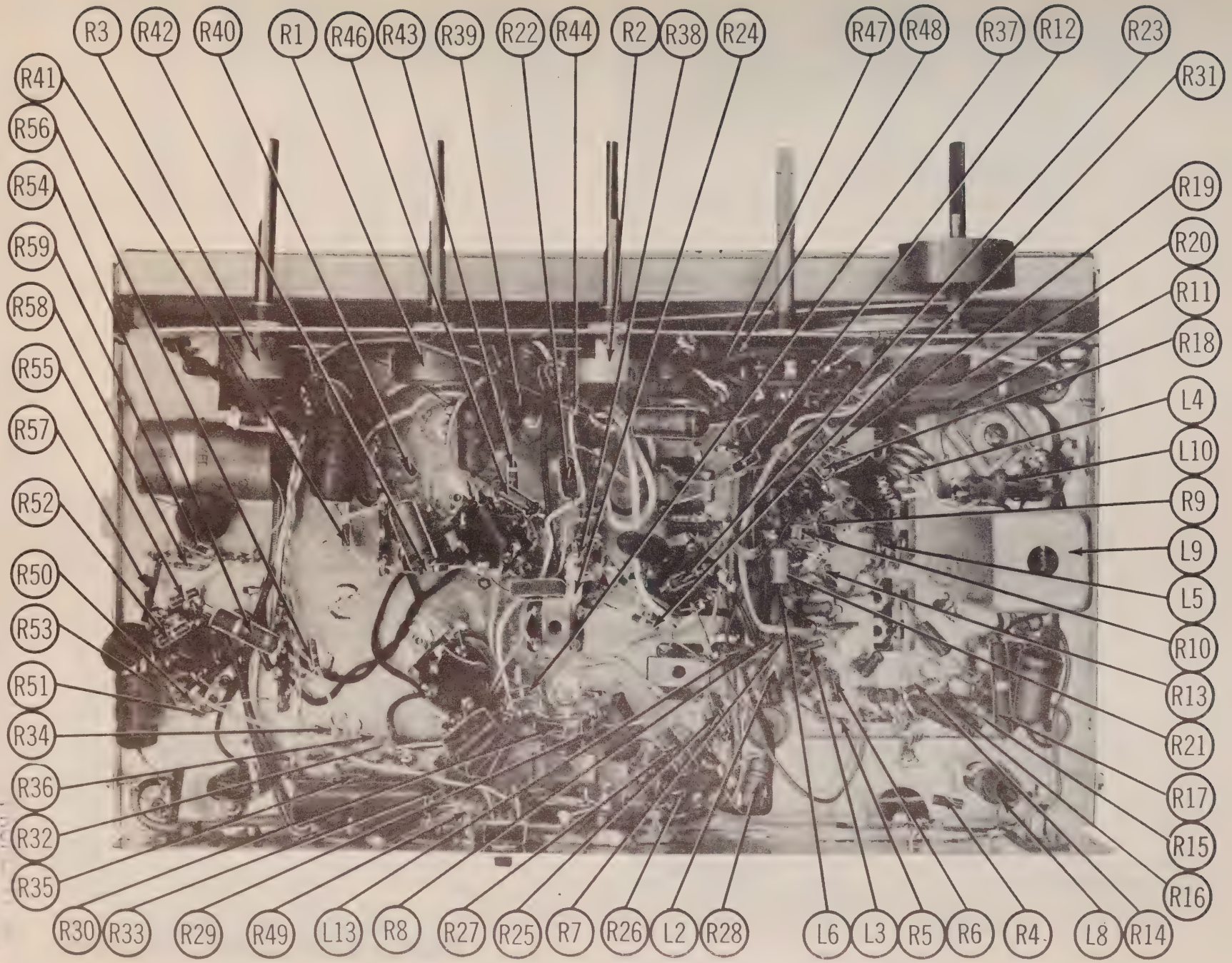


DIAL CORD DRIVE

PROPERTY OF

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


455KC
10.7MC
C19
C5
C48
C56
C55
C32
C47
A4
C34
A16
M3
C31
C49
C21
C54
C12
C28
C53
C14
C41
C13
C50
C30
C6
C29
C59
C15
C52
C16
C46
C27
C51
C17
C58
C22
C35
C26
C57
C24
A2
C11
455KC
C25
C18
C7
C45
C42
C7
C43
C44
A11
10.7MC
PRI.
C37
A
C39
B
C40
A14
10.7MC
C38
C36
C10
C33
C20
C23
C9
C8



L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: KNIGHT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	FM RF Amp.	6BA6	6BA6	7BK	
V2	FM Mixer	6BE6	6BE6	7CH	
V3	FM. Osc.	6C4	6C4	6BG	
V4	AM RF Amp.	6BA6	6BA6	7BK	
V5	AM Converter	6BE6	6BE6	7CH	
V6	1st IF Amp.	6SG7	6SG7	8BK	
V7	2nd FM IF Amp.	6SH7	6SH7	8BK	
V8	Ratio Det.	6AL5	6AL5	6BT	
V9	AM Det.	6J5	6J5	6Q	
V10A	Tuning Indicator	6E5	6E5	6R	
B	Tuning	6U5	6U5	6R	
V11	FM AVC. Clamper-AF Amp.	6SQ7	6SQ7	8Q	
V12	Phono Pre Amp.	6SL7	6SL7	8BD	
V13	AF Amplifier	6J5	6J5	6Q	
V14	Phase Inverter	6J5	6J5	6Q	
V15	Audio Output	6V6GT	6V6GT	7AC	
V16	Audio Output	6V6GT	6V6GT	7AC	
V17	Audio Output	6V6GT	6V6GT	7AC	
V18	Audio Output	6V6GT	6V6GT	7AC	
V19	Rectifier	5Y3GT	5Y3GT	5T	
V20	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH2-57		UPT4445		TVL-2764	▲ Filter
B	40	450							▬ Filter
C2A	40	450		AFH2-57		UPT4445		TVL-2764	▬ Decoupling
B	40	450							▲ Decoupling
C3A	50	150		AFH2-16		UP5515		TVL-2435	■ Audio Output Cathode §
B	50	150							▲ 2nd AF Amp. Cathode §
C4	25	25		PRS25/25		BR252A		TVA-1205	1st AF Amp. Cathode
C5A	15	450		AFH3-36		UP2245		TVA-2755	▬ Decoupling †
B	15	350							▲ Decoupling †
C6	20	450		PRS450/20		BR2045A		TVA-1709	Decoupling
C7	5	250		PRS250/4		BR425		TVA-1501	Stabilizing Cap.
C8	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	FM RF Coupling
C9A	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	FM RF Amp. Plate
B	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	FM RF Amp. Screen
C	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	FM RF Amp. Cathode
C10	500			SI500	D6-501	5W5T5	GP2K-501	5GA-T5	FM RF Amp. Fil.
C11	45			SI47	D6-470	5W5Q5	GP1K-470	5GA-Q47	FM RF Coupling †
C12	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	FM Mixer Screen
C13	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	FM Mixer Cathode
C14	500			SI500	D6-501	5W5T5	GP2K-501	5GA-T5	FM Mixer Fil.
C15	2				TCZ-2.2		NP0K-020		FM Osc. Coupling
C16	40						NP0L-400		FM Osc. Grid Cap.
C17	20						N150K-200		FM Osc. Grid Cap.
C18	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	FM Osc. Plate
C19	100			SI100	D6-101	5W5T1	GP1K-101	5GA-T1	FM Osc. Plate
C20	500			SI500	D6-501	5W5T5	GP2K-501	5GA-T5	FM Osc. Fil.
C21	2000			SI2000	D6-202	1W5D2	GP2-333-202	5HK-D2	FM Mixer Plate Dec.
C22	500			SI500	D6-501	5W5T5	GP2K-501	5GA-T5	AM RF Coupling
C23	3000			SI3000	D6-302	1W5D3	GP2-333-302	5HK-D33	AVC Filter
C24	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	AM RF Amp. Screen
C25	.02	200		P288-02	DF-203	PTE4S5		2TM-S2	AM RF Amp. Cathode
C26	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	AM RF Amp. Fil.
C27	5			SI5NP0	TCZ-4.7		NP0K-050		AM RF Coupling
C28	.05	400		P488-05	DF-503	PTE4S2		4TM-S5	AM Osc. Anode
C29	100	500		1468-0001	D6-101	5W5T1	GP1K-101	5GA-T1	AM Osc. Grid Cap.
C30	20			SI20NP0	TCZ-20		NP0K-200		Fixed Trimmer
C31	2000			SI2000	D6-202	1W5D2	GP2-333-202	5HK-D2	RF Bypass
C32	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C33	10000			BPD-01	DD-103	1D3S1	821-01	5HK-S1	1st IF Amp. Det.
C34	10000			BPD-01	DD-103	1D3S1	821-01	5HK-S1	1st IF Amp. Cathode
C35	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st IF Amp. Fil.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R18	22KΩ	½			AM Converter Grid
R19	150Ω	1			Parasitic Suppressor
R20	15KΩ	2			AM Converter Screen
R21	1KΩ	½		BTS-1K	Decoupling
R22	2KΩ	½		BTS-2K	1st IF Amp. Decoupling
R23	68Ω	½			1st IF Amp. Cathode
R24	50KΩ	½			Diode Filter - See note ♦
R25	220KΩ	½			2nd FM IF Amp. Grid
R26	68Ω	½			2nd FM IF Amp. Cathode
R27	22KΩ	1		BTS-22K	2nd FM IF Amp. Screen
R28	47KΩ	½			Voltage Divider
R29	1KΩ	½		BTS-1K	2nd FM IF Amp. Decoupling
R30	68Ω	½			Balancing
R31	470KΩ	½		BTS-470K	Decoupling
R32	1500Ω	½			Balancing
R33	1KΩ	½			Balancing
R34	6.8KΩ	½		BTS- 6.8K	Ratio Det. Diode Load
R35	6.8KΩ	½		BTS-6.8K	Ratio Det. Diode Load
R36	220KΩ	½		BTS-220K	AVC Network
R37	68KΩ	½			Parasitic Suppressor
R38	470KΩ	½		BTS-470K	AM Det. Diode Load
R39	22KΩ	½		BTS-22K	Tone Compensation
R40	47KΩ	½		BTS-47K	Tone Compensation - See note 5.
R41	47KΩ	½		BTS-47K	AF Amp. Decoupling - See note 5
R42	220KΩ	½		BTS-220K	AF Amp. Plate
R43	390KΩ	½		BTS-390K	Voltage Divider
R44	470KΩ	½		BTS-470K	Voltage Divider - See note 6.
R45	1Meg	½		BTS-1Meg	Tuning Indicator Plate Load
R46	7Meg	½			AF Amp. Grid - See note 7.
R47	2Meg	½		BTS-2Meg	AVC Network
R48	2Meg	½		BTS-2Meg	AVC Network
R49	6800Ω	½		BTS-6800	Phono Shunt
R50	33KΩ	½		BTS-33K	Phono Pre Amp. Plate
R51	220KΩ	½		BTS-220K	Phono PRE Amp. Grid
R52	3.3Meg	½		BTS-3.3Meg	Phono Pre Amp. Grid
R53	2.2KΩ	½		BTS-2.2K	Phono Pre Amp. Cathode
R54	8.2Ω	½			Filament Dropping
R55	68KΩ	½		BTS-68K	Phono Pre Amp. Plate
R56	68KΩ	½		BTS-68K	Phono Pre Amp. Decoupling
R57	220KΩ	½		BTS-220K	Tone Compensation
R58	27KΩ	½		BTS-27K	Tone Compensation
R59	180KΩ	½		BTS-180K	Tone Compensation
R60	1Meg	½		BTS-1Meg	Tuning Indicator Grid - See note 3.
R61	3.3 Meg	½		BTS-3.3Meg	Tuning Indicator Network - See note 3.
R62	470KΩ	½		BTS-470K	1st AF Amp. Grid
R63	8.2Ω	1			Feedback Network
R64	4700Ω	½		BTS-4700	1st AF Amp. Cathode
R65	220KΩ	½		BTS-220K	1st AF Amp. Plate
R66	4700Ω	½		BTS-4700	2nd AF Amp. Cathode
R67	47KΩ	½		BTS-47K	2nd AF Amp. Grid
R68	220KΩ	½		BTS-220K	2nd AF Amp. Plate
R69	39Ω	½			Parasitic Suppressor
R70	220KΩ	½		BTS-220K	1st Output Grid
R71	47KΩ	½		BTS-47K	Filter
R72	1000Ω	14		2D-1000	Filter - Wire Wound
R73	39Ω	½			Parasitic Suppressor
R74	39Ω	½			Parasitic Suppressor
R75	150KΩ	½		BTS-150K	3rd Output Grid
R76	39Ω	½			Parasitic Suppressor
R77	130Ω	5		1 3/4A-130	Output Cathode - Wire Wound
R78	4000Ω	10		1 3/4A-4000	Tone Compensation - Wire Wound
R79	4000Ω	10		1 3/4A-4000	Tone Compensation - Wire Wound
R80	1000Ω	14		2D-1000	Filter - Wire Wound
R81	100Ω	½		BTS-100	Feedback Network

Note 1. Some models use a 470KΩ resistor in this application.
Note 2. Some models use a 22KΩ resistor in this application.
Note 3. Not used in all models.
Note 4. Some models use a 100Ω resistor in this application.
♦ Items R24, C42A, C42B, are combined in one unit.
Note 5. Some models use a 68KΩ resistor in this application.
Note 6. Some models use a 560KΩ resistor in this application.
Note 7. Some models use a 10 Meg resistor in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C36	2000			SI2000	D6-202	1W5D2	GP2-333-202	5HK-D2	AVC Filter
C37	2000			SI2000	D6-202	1W5D2	GP2-333-202	5HK-D2	2nd FM IF Plate
C38	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd FM IF Screen
C39	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd FM IF Cathode
C40	2000			SI2000	D6-202	1W5D2	GP2-333-202	5HK-D2	RF Bypass
C41	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	RF Bypass ¶
C42	220	500		1468-00025	D6-221	5W5T25	GP2K-221	1FM-325	Diode Load Cap. *
C43	220	500		1468-00025	D6-221-	5W5T25	GP2K-221	1FM-325	Diode Load Cap. *
C44	220	500		1468-00025	D6-221	5W5T25	GP2K-221	1FM-325	Diode Load Cap *
C45	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	De-emphasis
C46A	100			SI100	♦PC-50	5W5T1	GP1K-101	♦100C1	Diode RF Filter
B	100			SI100		5W5T1	GP1K-101		Diode RF Filter
C47	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C48	47			SI47	D6-470	5W5Q5	GP1K-470	5GA-Q47	Tone Comp.
C49	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C50	2000			SI2000	D6-202	1W5D2	GP2-333-202	5HK-D2	FM AVC Filter
C51	220	500		1468-00025	D6-221	5W5T25	GP2K-221	1FM-325	AF Amp. Plate † †
C52	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C53	10000			BPD-01	DD-103	1D3S1	821-01	5HK-S1	Tone Comp.
C54	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Tone Comp.
C55	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Tone Comp.
C56	.02	200		P288-02	DF-203	PTE4S2		2TM-S2	Tone Comp.
C57	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C58	10000			BPD-01	DD-103	1D3S1	821-01	5HK-S1	Audio Coupling
C59	10000			BPD-01	DD-103	1D3S1	821-01	5HK-S1	RF Bypass
C60	500			SI500	D6-501	5W5T5	GP2K-501	5GA-T5	Fil. Bypass **
C61	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Aidio Coupling
C62	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C63	.002	600		P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Output Plate
C64	.002	600		P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Output Plate
C65	.05	400		4689ZGXY		PTE6S5		4TM-S5	Line Filter
C66	.05	400		4689ZGXY		PTE6S5		4TM-S5	Line Filter

† Some models use 20MFD in this application.
‡ Some models use 40MMF in this application.
¶ Some models use .05MFD in this application.
* Some models use 270MMF in this application.
†† Some models use 250MMF in this application.
♦ Items C42A, C42B, R24 are combined in one unit.
** Not used in all models.
§ Some models use 25MFD ⓐ 25VDC in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	KNIGHT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	A-9.127	Q13-133	AT-78	AN-60	Volume Control
B	Shaft		Not Req.	Not Req.	FS-3	AK-3	Attach to R1A per instructions.
R2A	1Meg	½	A-9.129	Q11-137	AM-61-S	AN-69	Bass Control
B	Shaft		Not Req.	Not Req.	FS-3	AK-3	Attach to R2A per instructions.
R3A	1Meg	½	A-9.128	Q13-137	AM-63-Z	AN-70	Treble Control
B	Shaft		Not Req.	Not Req.	FS-3	AK-3	Attach to R3A per instructions.
C	Switch		Not Req.	76-1	SW-A	K-155	Attach to R3A per instructions.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	KNIGHT PART No.	IRC PART No.	IDENTIFICATION CODES
R4	1KΩ			BTS-1K	Antenna Isolation
R5	350KΩ				FM-RF Amp. Grid - See note 1.
R6	68Ω				FM-RF Amp. Cathode
R7	47KΩ				FM-RF Amp. Screen - See note 2.
R8	47KΩ				FM-RF Amp. Screen - See note 3.
R9	22KΩ				FM Mixer Grid
R10	150Ω			BTA-180	FM Mixer Cathode
R11	15KΩ				FM Mixer Screen
R12	1KΩ			BTS-1K	Decoupling
R13	47KΩ				FM Osc. Grid
R14	470KΩ				AM RF Amp. Grid
R15	200Ω			BTS-200	AM RF Amp. Cathode - See note 4.
R16	200Ω			BTS-200	AM RF Amp. Cathode - See note 3.
R17	22KΩ				AM RF Amp. Screen

PROPERTY OF LANKENS HEADS ST

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	KNIGHT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ⓐ 1.25A	570VCT .190ADC	5VAC ⓐ 4.0A	6.3VAC ⓐ 5.8A	B18.077		P-3072 ①	PH-200 ① ②

① Add series resistor to reduce high voltage
② Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	KNIGHT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T2	5KΩ CT	500Ω 250Ω 15Ω 8Ω 4Ω	160Ω CT	22Ω 13.5Ω 1.3Ω .9Ω .6Ω	B15.037	A-3800 ②	A-3131 ②	BO-9 ②	② Drill new mounting holes.

COILS (RF-IF)

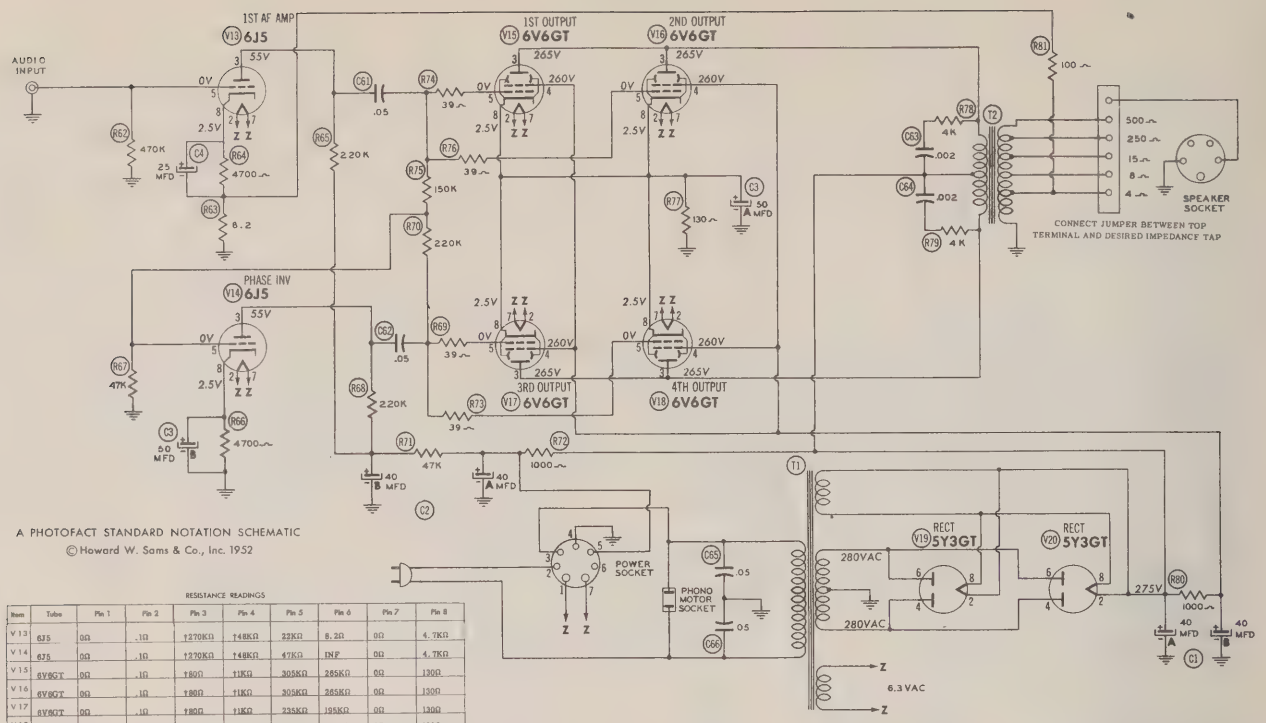
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	KNIGHT PART No.	MERIT PART No.	NOTES
L1	FM Ant. Coil	0Ω		N2.411		
L2	Fil. Choke	0Ω		N2.416		
L3	RF Choke	1Ω		A2.402		
L4	FM RF Coil	0Ω		N2.412		
L5	FM Osc. Coil	0Ω		N2.413		
L6	Fil. Choke	0Ω		N2.416		
L7	AM Loop Ant.	.4Ω		C5.027		
L8	AM Ant. Loading Coil	1.6Ω		B2.423		
L9	AM RF Coil	90Ω	2.4Ω	B2.409	BC-385	
L10	AM Osc. Coil	.5Ω	6.5Ω	A2.410	BC-397	
L11	1st AM IF	9Ω	9Ω	N2.414	BC-352	
L12	1st FM IF	.5Ω	.5Ω	N2.415	FM-254	
L13	Fil. Choke	0Ω		N2.439		
L14	2nd AM IF	9Ω	9Ω	N2.414	BC-352	
L15	2nd FM IF	.5Ω	.5Ω	N2.415	FM-254	
L16	Ratio Det. Trans.	1.6Ω	.8Ω	C2.278	FM-255	Tap ⓐ .7Ω

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	KNIGHT PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	I12301		Type #47
M2	Bayonet	6-8	.15	Brown	I12301		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M3	Switch	A12.102	Function Selector
M4	Switch		Phono Pre-Amp.
M5	Tuning Cap.	B6.070	(40-537MMF, 40-533MMF, 24-517MMF) AM Sections
A8	Trimmer	C13518	AM Osc. Padder (500-1000MMF)
A17	Trimmer	N20.022	FM Osc. Adj.
A18	Trimmer	N20.022	FM RF Adj.



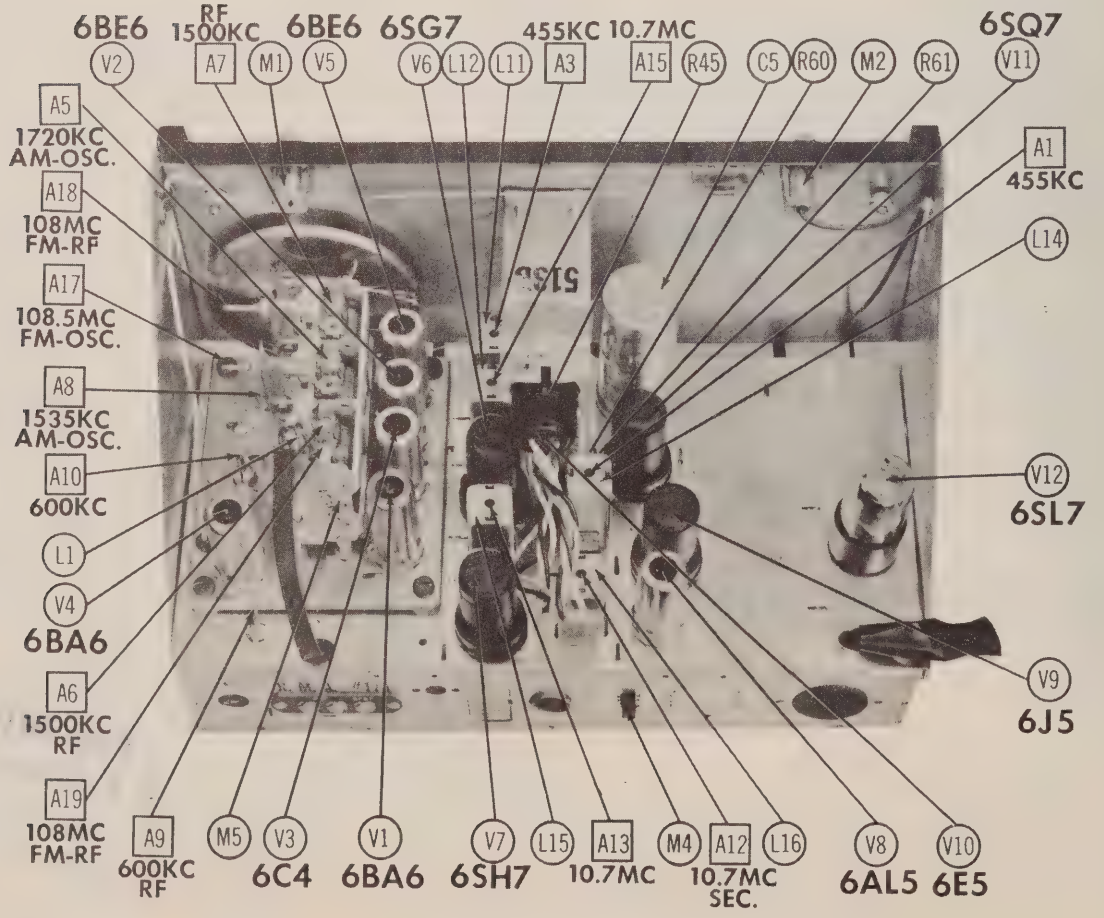
RESISTANCE READINGS

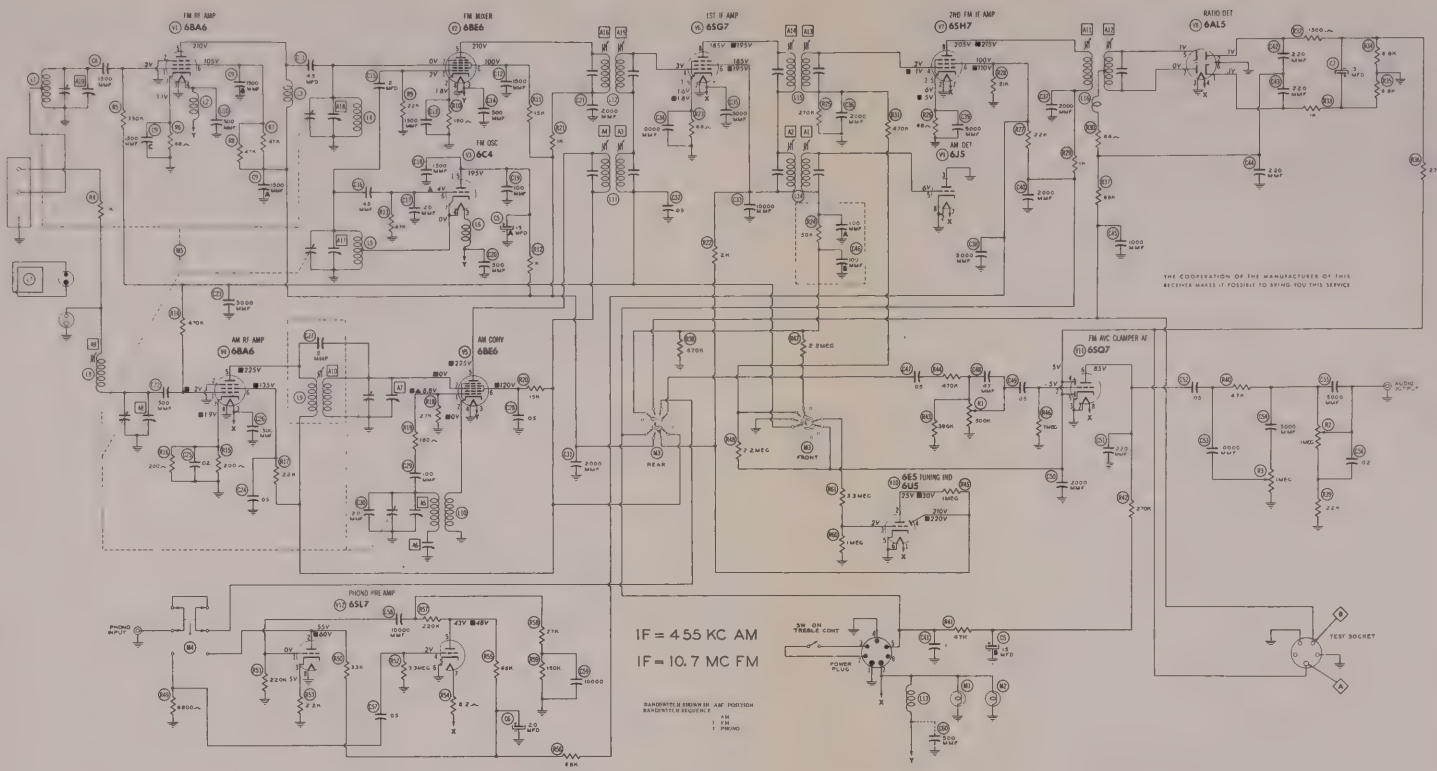
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 13	6J5	0Ω	.1Ω	†270KΩ	†48KΩ	22KΩ	8.2Ω	0Ω	4.7KΩ
V 14	6J5	0Ω	.1Ω	†270KΩ	†48KΩ	47KΩ	INF	0Ω	4.7KΩ
V 15	6V6GT	0Ω	.1Ω	†80Ω	†1KΩ	305KΩ	285KΩ	0Ω	130Ω
V 16	6V6GT	0Ω	.1Ω	†80Ω	†1KΩ	305KΩ	285KΩ	0Ω	130Ω
V 17	6V6GT	0Ω	.1Ω	†80Ω	†1KΩ	335KΩ	195KΩ	0Ω	130Ω
V 18	6V6GT	0Ω	.1Ω	†80Ω	†1KΩ	335KΩ	195KΩ	0Ω	130Ω
V 19	5Y3GT	0Ω	38KΩ	INF	30Ω	INF	80Ω	INF	38KΩ
V 20	5Y3GT	0Ω	38KΩ	INF	32Ω	INF	32Ω	INF	38KΩ

ALL MEASUREMENTS TAKEN IN "FM" POSITION, UNLESS NOTED
■ MEASURED IN AM POSITION
† MEASURED FROM PIN 2 OF V7 & V8

164-4

AUDIO & POWER SUPPLY CHASSIS





RESISTANCE READINGS

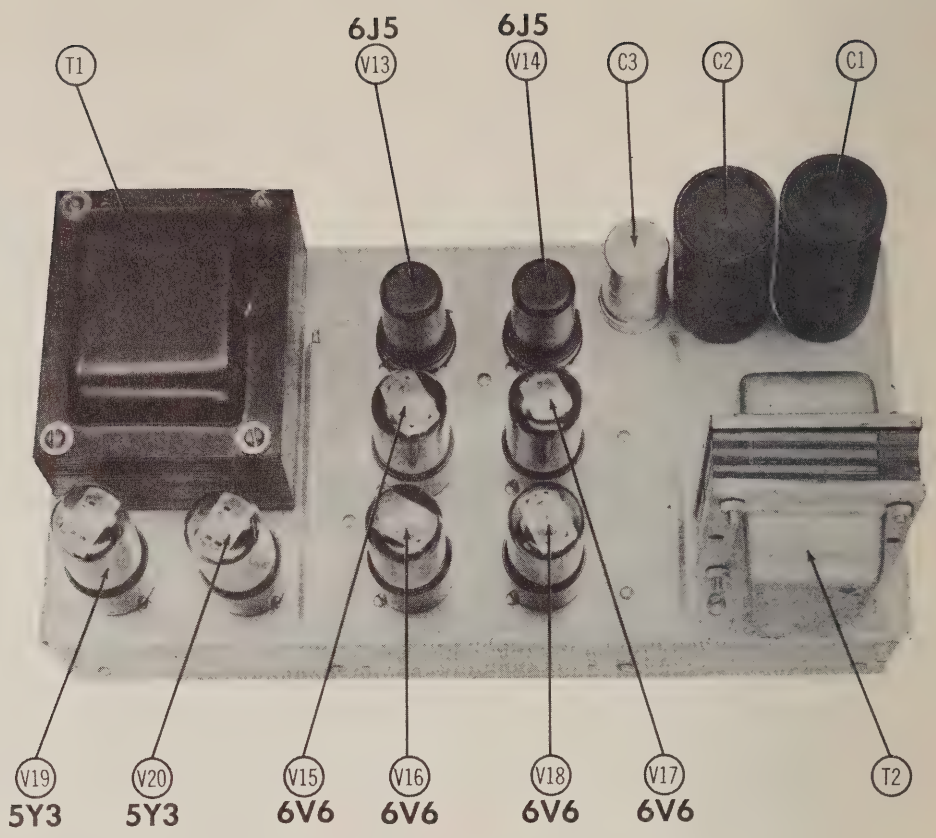
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	1Meg	0Ω	2Ω	0Ω	11KΩ	122KΩ	68Ω	
V 2	6BE6	22KΩ	150Ω	1Ω	0Ω	12KΩ	118KΩ	0Ω	
V 3	6C4	125Ω	INF	1Ω	0Ω	13KΩ	47KΩ	0Ω	
V 4	6BA6	∞1Meg	0Ω	0Ω	1Ω	∞11.3KΩ	∞122KΩ	100Ω	
V 5	6BE6	22KΩ	70Ω	1Ω	0Ω	∞11KΩ	∞118Ω	2.2Ω	
V 6	6AQ5	0Ω	0Ω	68Ω	240KΩ at 85Meg	68Ω	13KΩ	1Ω	1.3KΩ
V 7	6SH7	0Ω	0Ω	68Ω	330KΩ	68Ω	122KΩ	1Ω	13KΩ
V 8	6AL5	1.8KΩ	8.2KΩ	0Ω	1Ω	INF	0Ω	INF	
V 9	6J5	0Ω	0Ω	0Ω	INF	530KΩ	INF	1Ω	0Ω
V 10	6E5	0Ω	11Meg	835KΩ at 800KΩ	11KΩ	0Ω	1Ω		
V 11	6SQ7	0Ω	10Meg	0Ω	250KΩ	230KΩ	1270KΩ	1Ω	0Ω
V 12	6U-7	330KΩ	170KΩ	3.2KΩ	3.3Meg	1100KΩ	0Ω	2.4Ω	0Ω

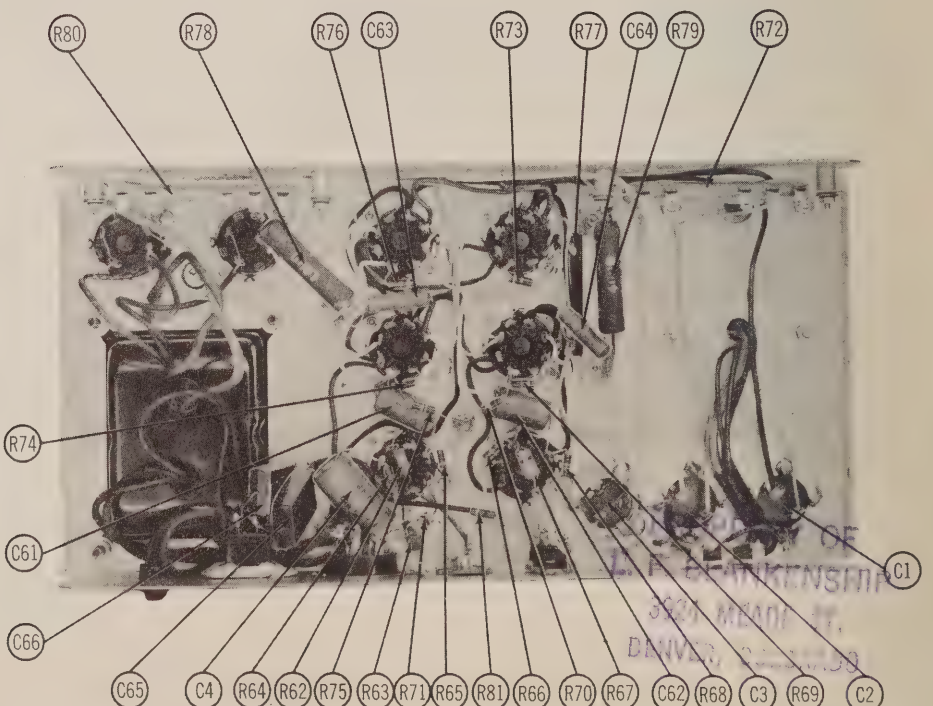
ALL MEASUREMENTS TAKEN IN "FM" POSITION, UNLESS NOTED
* MEASURED IN "AM" POSITION
† MEASURED FROM PIN 2 OF V7 and V8

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W Sams & Co., Inc. 1952


6J5
6J5
T1
V13
V14
C3
C2
C1
V19
5Y3
V20
5Y3
V15
6V6
V16
6V6
V18
6V6
V17
6V6
T2


R80
R78
R76
C63
R73
R77
C64
R79
R72
R74
C61
C66
C65
C4
R64
R62
R75
R63
R71
R65
R81
R66
R70
R67
C62
R68
C3
R69
C2
C1

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to the calibration mark just to the left of the 55 on the AM dial scale.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be not higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7, (grid), of 6BE6, (V5). Low side to chassis.	455KC (400∿ mod)	AM (CW)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	50MMF	High side to "BC" ant. terminal. Low side to chassis.	1720KC	"	"	"	A5	"
3.	"	"	535KC	"	Tuning gang fully closed.	"	A6	Adjust for maximum output. Repeat steps 2 and 3 until no further improvement can be made.
4.	"	"	1500KC	"	Tune for max. output.	"	A7, A8	Adjust for maximum output.
5.	"	"	600KC	"	600KC	"	A9, A10	Adjust A9 for maximum deflection. Turn A10, fully out, (counter-clockwise). Adjust inward to first peak. Repeat step 4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 4, (grid), of 6SH7, (V7). Low side to chassis.	10.7MC (unmod)	FM (center)	Tuning gang fully closed.	DC probe to point (A). Common to chassis.	A11	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	"	High side to pin 4, (grid) of 6SG7, (V6). Low side to chassis.	"	"	"	DC probe to point (A). Common to chassis.	A13, A14	Adjust for maximum deflection.
9.	"	High side to pin 7, (grid), of 6BE6, (V2). Low side to chassis.	"	"	"	"	A15, A16	"

FIG. 1

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 4, (grid), of 6SH7, (V7). Low side to chassis.	10.7MC (450KC Swp)	FM (center)	Point of non-interference.	Vert. Amp. to point (B). Low side to chassis.	A12, A11	Adjust A12 so 10.7MC occurs at center of crossover lines as per fig. 1. Adjust A11 for max. amplitude and straightness of crossover lines.
7.	"	High side to pin 4, (grid), of 6SG7, (V6). Low side to chassis.	"	"	"	Vert. Amp. to point (A). Low side to chassis.	A13, A14	Disconnect stabilizer capacitor C3. Adjust for max. amplitude and symmetry as per fig. 2.
8.	"	High side to pin 7, (grid), of 6BE6, (V2). Low side to chassis.	"	"	"	"	A15, A16	Adjust for max. amplitude and symmetry as per fig. 2. Continue with step 10 after reconnecting C3

FIG. 2

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	300Ω carbon resistors	High side thru 300Ω to ant. terminal A2. Low side to chassis.	108.5MC (unmod)	FM	Tuning gang fully open.	DC probe to point (A). Common to chassis.	A17	Adjust for maximum deflection.
11.	"	"	87.5MC	"	Tuning gang fully closed.	"	L5	Check coil with a tuning wand. If necessary expand or compress coil turns for maximum deflection. If coil is changed repeat steps 10 and 11 until no further improvement can be made.
12.	"	"	108MC	"	Tune for max. deflection.	"	A18, A19	Adjust for max. deflection.
13.	"	"	90MC	"	"	"	L1, L4	Check coils with a tuning wand. If necessary expand or compress coil turns for maximum deflection. If coils are changed repeat steps 12 and 13 until no further improvements can be made.

MONITORADIO
MODEL AR-1

MONITORADIO
MODEL AR-1

TRADE NAME	Monitoradio, Model AR-1
MANUFACTURER	Radio Apparatus Inc., 55 N. New Jersey, Indianapolis, Ind.
TYPE SET	AC-DC Operated High Frequency AM Superheterodyne Receiver
TUBES (SIX)	Types 12AT7 Conv., 6BJ6 1st. IF Amp., 6BJ6 2nd. IF Amp., 12AX7 Squelch Cont.-AF Amp., 50C5 Audio Output, 35W4 Rectifier.
POWER SUPPLY	110-120 Volts AC/DC RATING .27 Amp. @ 117 Volts AC
TUNING RANGE—	SHORT WAVE 108-132MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Direct	High side to ant. terminal "1". Low side to terminal "2".	10.7MC (400~Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4, A5, A6	Adjust for maximum output.
2.	"	"	132MC	132MC	"	A7, A8	"
3.	"	"	108MC	108MC	"	L3, L1	Check coils with a tuning wand. If necessary expand or compress coil turns for maximum output. If coils are changed repeat steps 2 & 3 until no further improvement can be made.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MONITORADIO PART No.	STANDARD REPLACEMENT		
V1	Converter	12AT7	12AT7	9A	
V2	1st. IF Amplifier	6BJ6	6BJ6	7CM	
V3	2nd. IF Amplifier	6BJ6	6BJ6	7CM	
V4	Squelch Control— AF Amplifier	12AX7	12AX7	9A	
V5	Audio Output	50C5	50C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

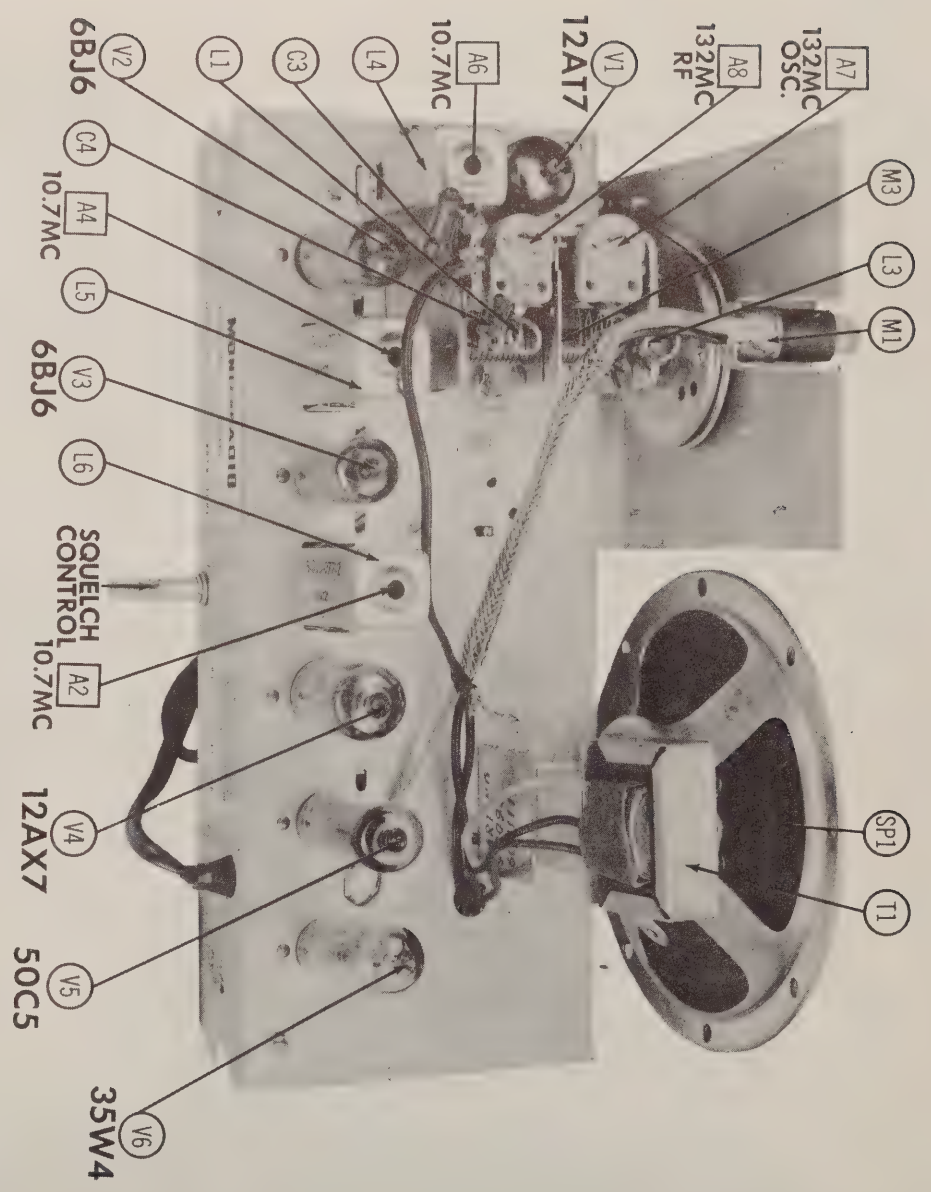
ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MONITORADIO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	50	150		PRS150/50-30-20		EDL5315C		TVA-3430	Filter (Red)
B	30	150							Filter (Blue)
C	20	25							Output Cathode (Yellow)
C2	2	50		PRS150/4		BBR2-50		TVA-1301	1st.AF Amp. Cathode
C3	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	Ant. Isolation
C4	56		JCD-A1	SI56	D6-560		GP1K-560	MS-46	RF Coupling
C5	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	Mixer Cathode Bypass
C6	270			SI270	D6-271	5W5T3	GP2K-271	5GA-T27	Conv.Fil. Bypass
C7	1.5		JM	SI1.5NP0	TCZ-1.5		NP0K-1R5		Osc. Coupling
C8	27		PQ		TCN-27		N750K-270		Osc. Grid Cap.
C9	2.7		100-203				N750K-2R7		Fixed Trimmer
C10	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	Conv.Decoupling
C11	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	RF Bypass
C12	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	AVC Filter
C13	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	1st.IF Amp. Decoupling
C14	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	1st.IF Amp. Cathode
C15	270			SI270	D6-271	5W5T3	GP2K-271	5GA-T27	1st.IF Amp. Fil.
C16	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	AVC Filter
C17	10000		JCD-C7	SI10000	D6-103	1D3S1	GP2-333-103	5HK-S1	2nd.IF Amp. Decoupling
C18	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	2nd.IF Amp. Cathode
C19	10000		JCD-C4	SI10000	D6-103	1D3S1	GP2-333-103	5HK-S1	2nd.IF Amp. Fil.
C20	100	500		1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Det. RF Filter
C21	270			SI-270	D6-271	5W5T3	GP2K-271	5GA-T27	RF Bypass
C22	1000			BPD-001	DD-103	1W5D1	801-001	5HK-D1	AVC Filter
C23	.5	100		P185-.5		GT2P5		68P20	AVC Filter
C24	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	Audio Coupling
C25	270			SI270	D6-271	5W5T3	GP2K-271	5GA-T27	AF Amp.Plate Bypass
C26	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C27	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Output Plate
C28	270			SI270	D6-271	5W5T3	GP2K-271	5GA-T27	Rectifier Plate
C29	56				TCN-56		N750L-560		Fixed Trimmer *

* Not used in all Models

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Monitoradio PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	250KΩ	½	A-100-093-6	Q13-130	AG-64-Z		Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3		Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB		Attach to R1A per instructions
R2A	25KΩ	½	A-100-093-7		AG-72-V		Squelch Control
B	Shaft		Not Req.		KSS-3		Attach to R2A per instructions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Monitoradio PART No.	IRC PART No.	
R3	1KΩ	½		BTS-1K	Mixer Cathode
R4	10KΩ	½		BTS-10K	Osc. Grid
R5	1KΩ	½		BTS-1K	Converter Decoupling
R6	100KΩ	½			1st. IF Amp. Grid
R7	82Ω	½		BTS-82	1st. IF Amp. Cathode
R8	470Ω	½		BTS-470	1st. IF Amp. Decoupling
R9	220KΩ	½		BTS-220K	AF Amp. Plate
R10	82Ω	½		BTS-82	2nd. IF Amp. Cathode
R11	470Ω	½		BTS-470	2nd. IF Amp. Decoupling
R12	33KΩ	½		BTS-470K	AVC Network
R13	470KΩ	½		BTS-470K	AVC Network
R14	220KΩ	½		BTS-220K	Bias Network
R15	68KΩ	½		BTS-68K	Bias Network
R16	2.2Meg	½		BTS-2.2Meg	AF Amp. Grid
R17	1KΩ	1		BTA-1K	Filter
R18	470KΩ	½		BTS-470K	Output Grid
R19	150Ω	1		BTA-150	Output Cathode

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Monitoradio PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.3KΩ	3.9Ω	175Ω tapped @15Ω	.5Ω	Part of 300-071-2	A-3330 ①	A-3031 ①	RO-3 ①	① Bend Mounting Tabs Down, file out slots and mount on original Bracket.

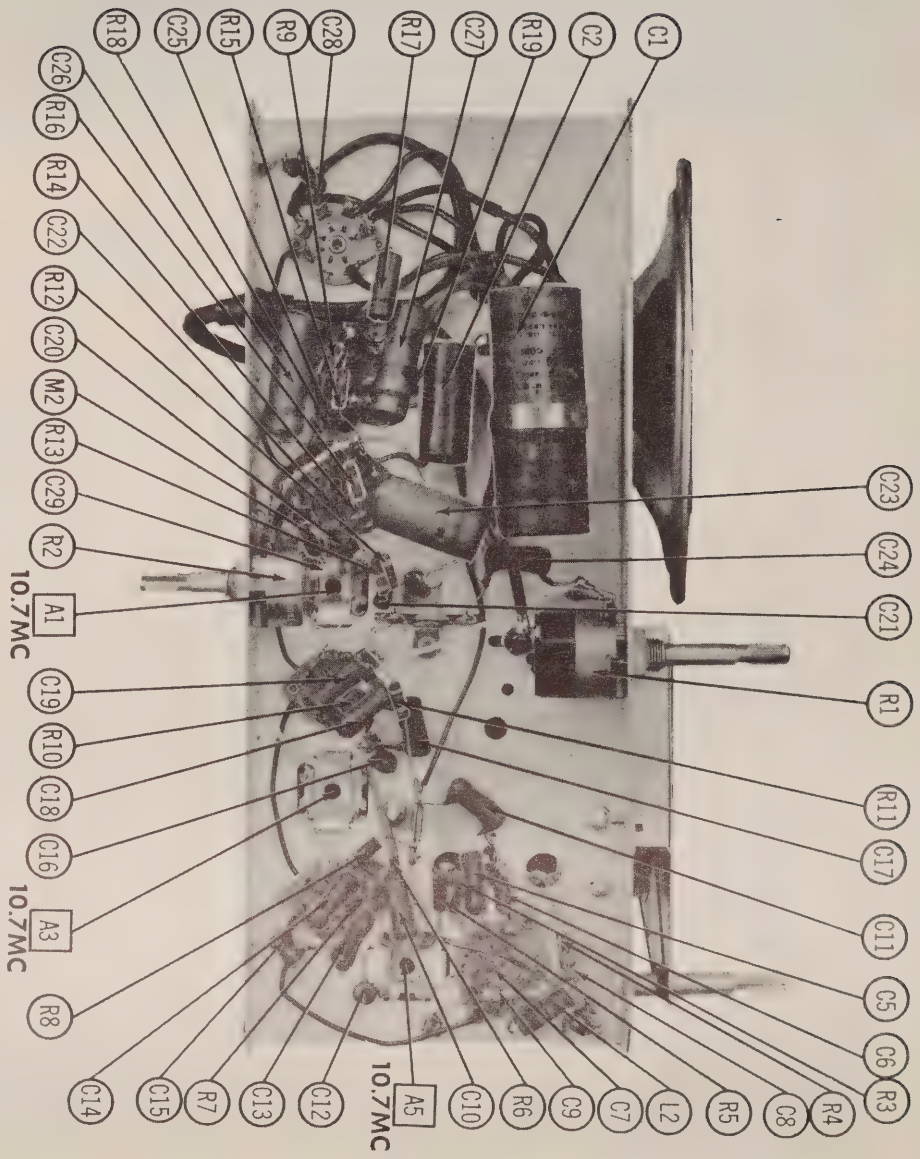
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Monitoradio PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.9Ω	300-071-2	ST-105① ② Mod. P5-X	5A1 ② ③	① Use Universal Mounting Bracket ② Mount output Trans. on chassis. ③ Fabricate New Mounting Bracket.
	CONE DIA.	V. C. DIA.				
SP1B	5"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Monitoradio PART No.	MERIT PART No.	IRC PART No.	
L1	Ant. Coil	0Ω		300-218-2			
L2	Cath. Choke	.8Ω		CLA		CLA	1 Microhenry
L3	Osc. Coil	0Ω		300-218-1			
L4	1st. IF Trans.	1.5Ω	1.5Ω	300-077-2	FM-254		
L5	2nd. IF Trans.	1.5Ω	1.5Ω	300-077-2	FM-254		
L6	3rd. IF Trans.	1.5Ω	1.5Ω	300-077-3	FM-254		

CHASSIS—BOTTOM VIEW



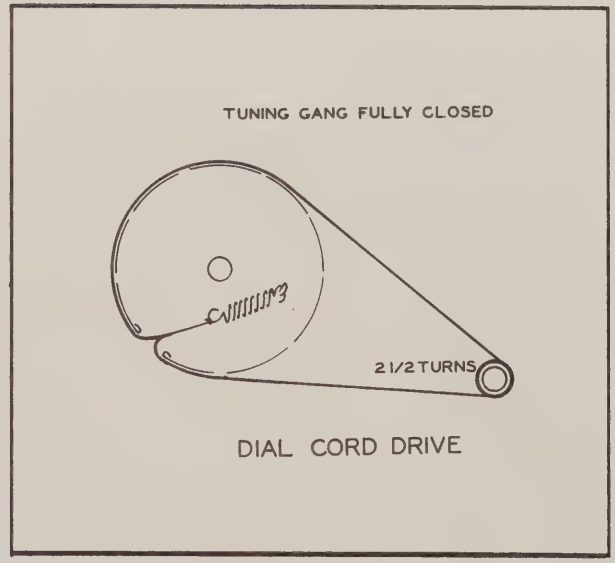
PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

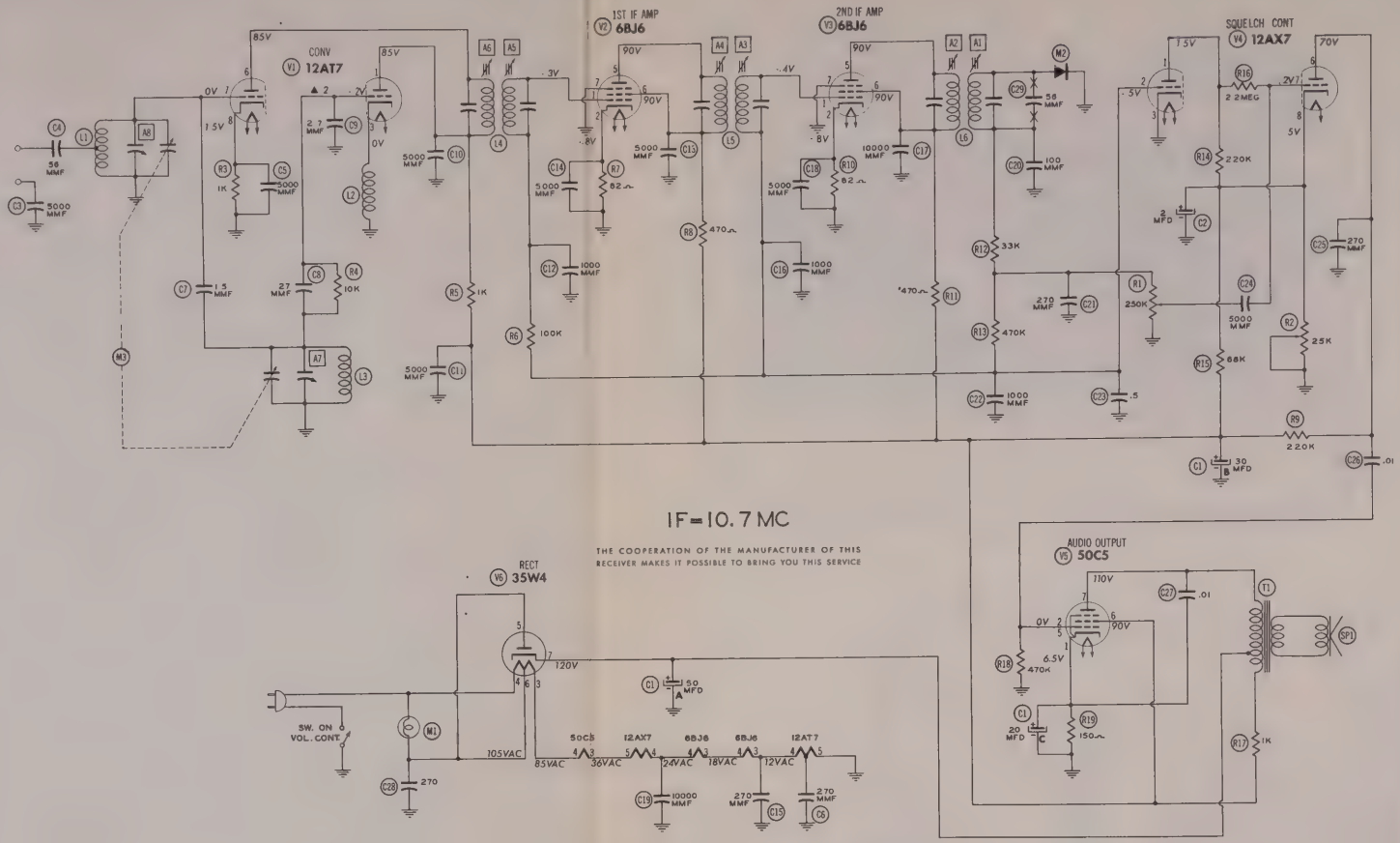
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PART No.		
M1	Bayonet	7.5	.2	White			Type #51

MISCELLANEOUS

ITEM No.	PART NAME	Monitoradio PART No.	NOTES
M2	Crystal		1N51
M3	Tuning Cap	300-060-4	
A7	Trimmer	TS2A-N300	Osc. Adj. (3-13MMF)
A8	Trimmer	TS2A-N300	Ant. Adj. (3-13MMF)
	Cabinet	29-9A	
	Dial Window	135	
	Dial Pointer	1774E	
	Knob	200	Tuning & Volume
	Knob	400-P	Squelch



DIAL CORD DRIVE



IF = 10.7 MC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	†2KΩ	10KΩ	.6Ω	12Ω	0Ω	†2KΩ	0Ω	1KΩ	6Ω
V 2	6BJ6	620KΩ	82Ω	12Ω	18Ω	†1.5KΩ	†1.5KΩ	0Ω		
V 3	6BJ6	520KΩ	82Ω	18Ω	24Ω	†1.5KΩ	†1.5KΩ	0Ω		
V 4	12AX7	220KΩ	520KΩ	0Ω	24Ω	36Ω	†220KΩ	2.7Meg	3KΩ	30Ω
V 5	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	†175Ω		
V 6	35W4	†15Ω	INF	86Ω	121Ω	103Ω	103Ω	50KΩ		

† MEASURED FROM PIN 7 OF V6
♦ TAKEN WITH VACUUM TUBE VOLTMETER

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PROF
E T
3924 MEADE ST.
DENVER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1952

PHOTOFACT* Folder

MUNTZ
MODEL 2060

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

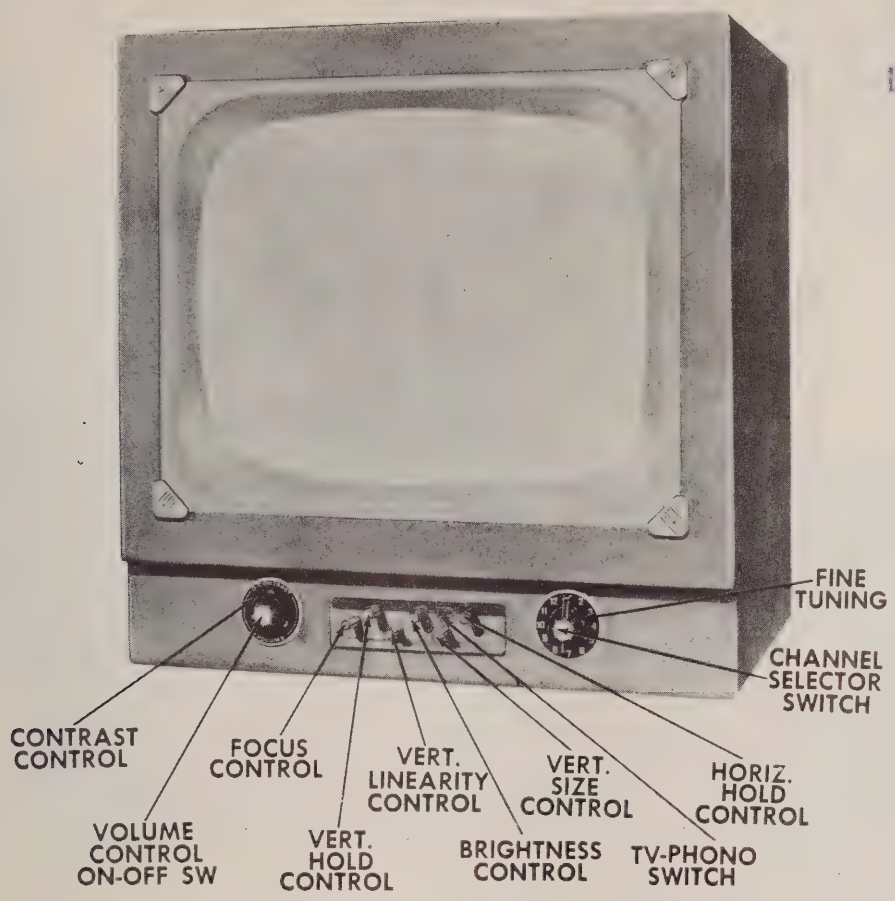
MUNTZ
MODEL 2060

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 4–52 SET 164 FOLDER 6

PROPERTY OF
L. F. BLANKENSHIP
3921
D-



MUNTZ
MODEL 2060

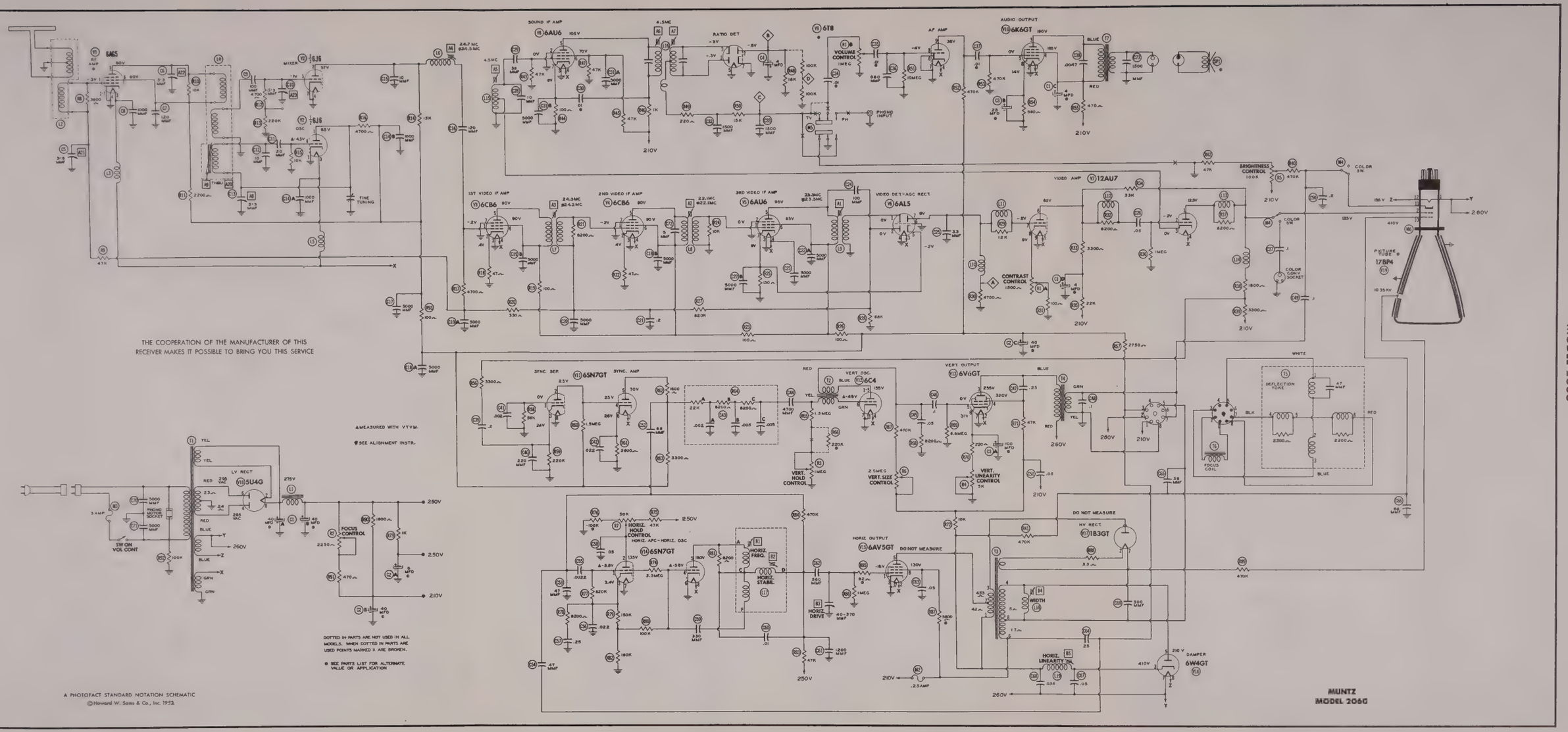
TRADE NAME	Muntz Model 2060
SUPPLIER	Muntz TV Inc., 1735 Belmont , Chicago Ill.
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110-120 Volts AC - 60 Cycle
RATING	1.6 Amp. at 117 Volts AC
TUNING RANGE	CHANNELS 2 thru 13

INDEX

Alignment Instructions 6, 7
Disassembly Instructions.....11
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 12, 13, 14
Photographs
Cabinet - Rear View 11
Capacitor and Alignment Identification.....4, 9
Chassis - Top View.....3
Photographs (Cont.)
RF Tuner.....10
Resistor and Inductor Identification.....15, 16
Resistance Measurements.....8
Schematic.....2
Schematic (Alternate Tuner).....8
Tube Placement Charts.....5

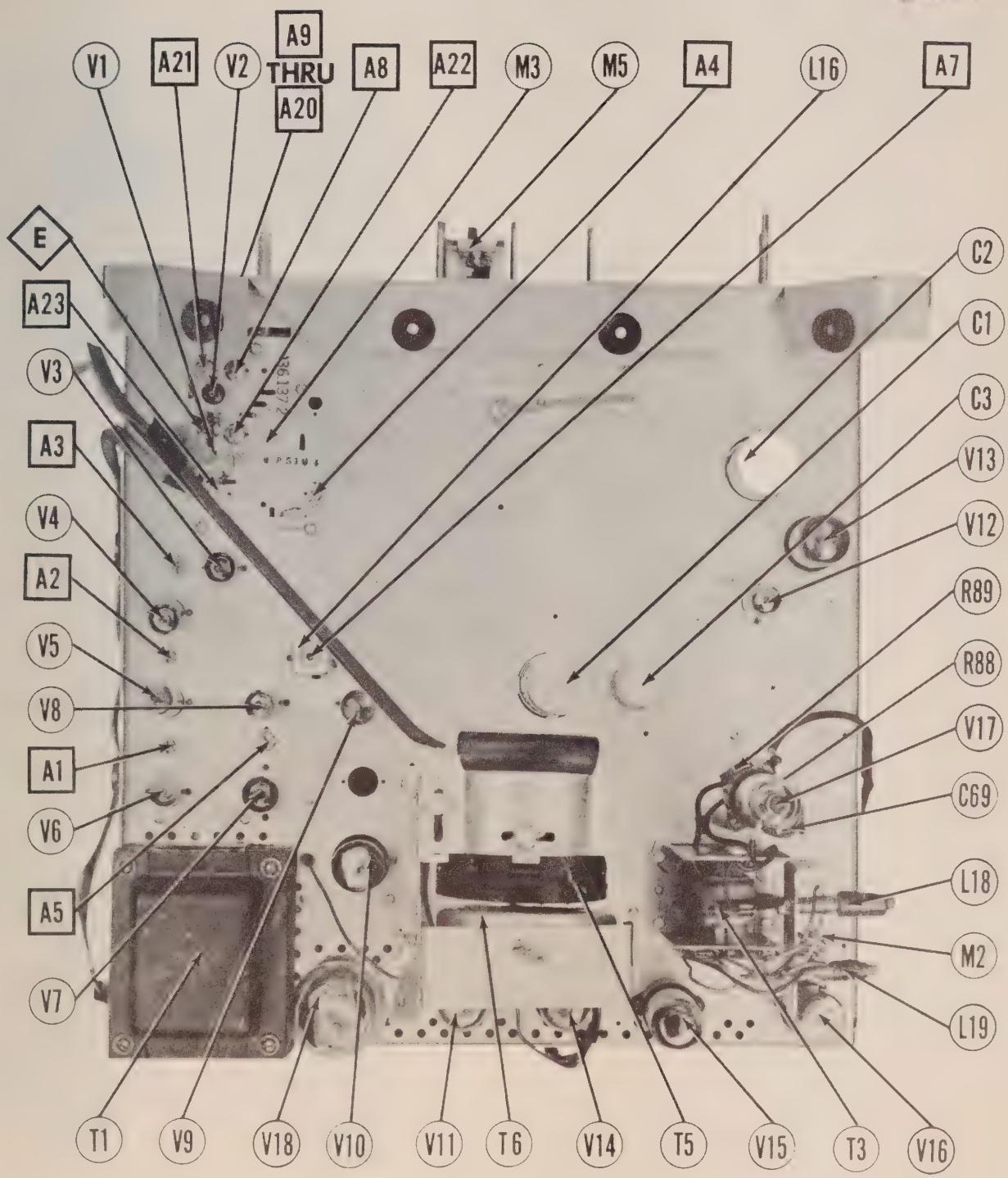
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

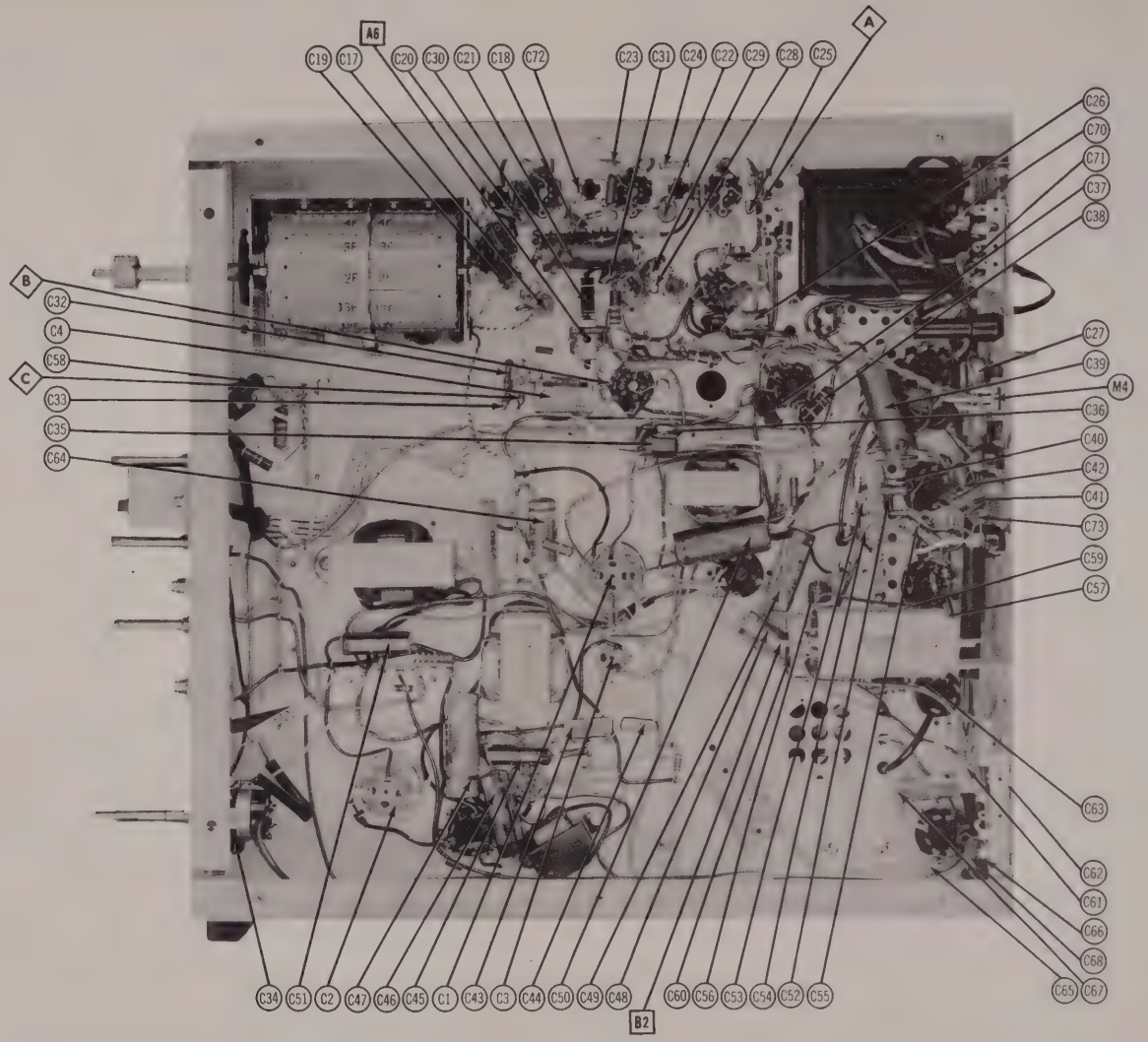

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
MEASURED WITH VTVM.
SEE ALIGNMENT INSTR.
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1952
MUNTZ
MODEL 2060

MUNTZ
MODEL 2060

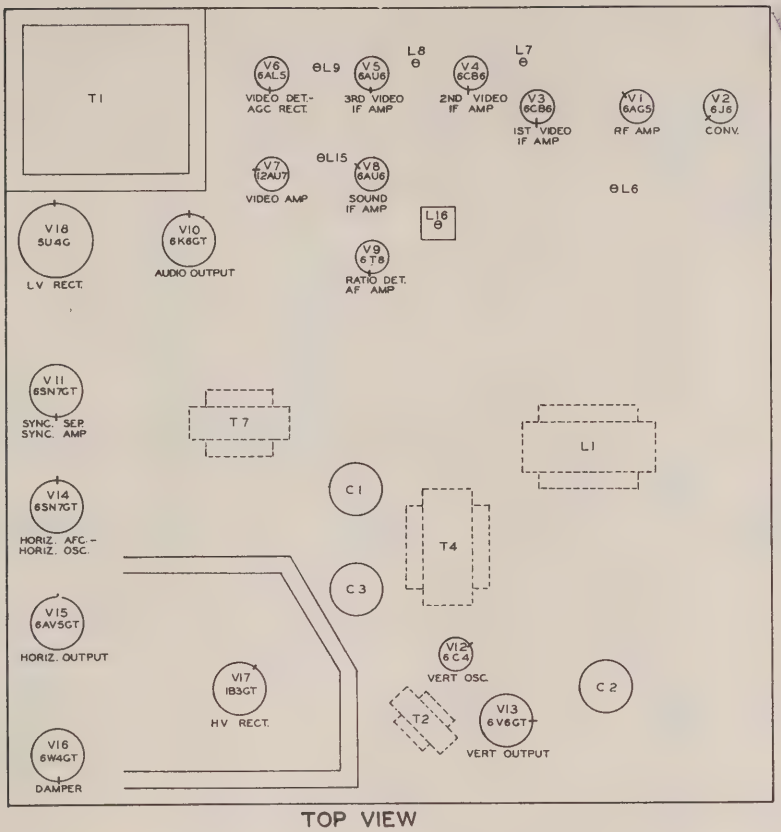
DENVER, COLORADO



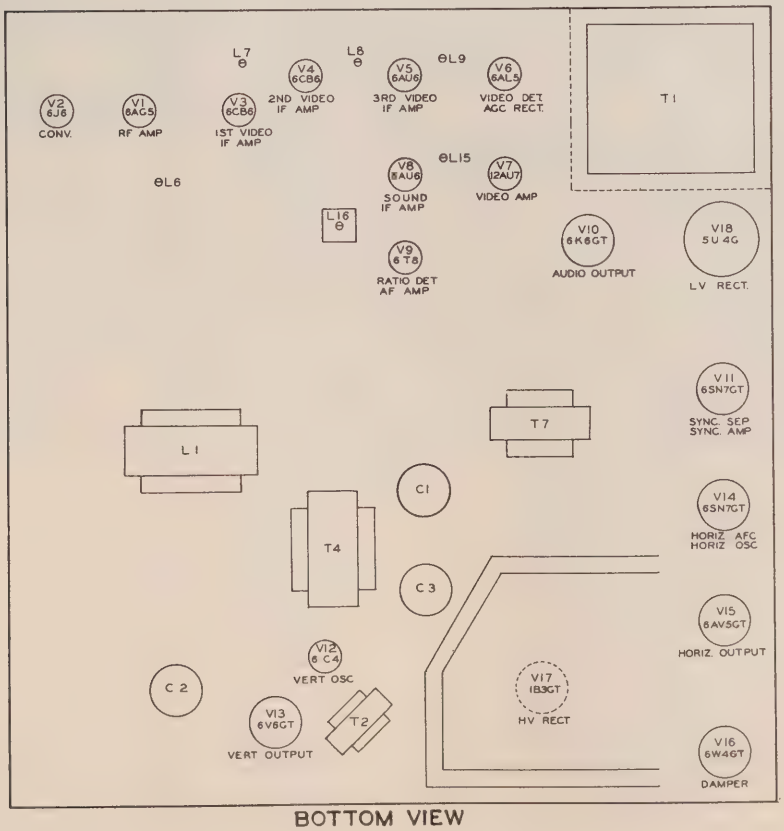
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

PROPERTY OF

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis; do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C2i, connect the positive lead to chassis.
If no bias supply is available, short C2i and use the frequencies in the table and figures marked by an asterisk (*).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	23.3MC *23.3MC	Any	DC probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	22.1MC *22.1MC	"	"	A2	"
3.	"	"	24.9MC *24.2MC	"	"	A3	"
4.	"	"	24.7MC *24.5MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	23MC (10MC SWP)	22MC *21.9MC 24.75MC *24.6MC	Any	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (½ %) resistors in series from Point (B) to chassis. The junction of these two resistors is alignment Point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	1500MMF	High side to Point A . Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point (D). Common to chassis.	A5, A6	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to Point (C). Common to Point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	1500MMF	High side to Point A . Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (D). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C4. Adjust for maximum amplitude and symmetry as per figure 2.
7.	"	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A7	Reconnect capacitor C4. Adjust A7 so 4.5MC occurs at center of crossover lines as per figure 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT (STANDARD COIL TUNER)

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A8. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channels.
If adjustment of A8 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect an external marker generator, set at 24.75MC, to an ungrounded tube shield slipped over the first video IF amplifier.
This marker generator is used to provide a video IF marker on the response curve. The video carrier marker is fed into the set at the antenna and the oscillator adjusted for zero beat of the markers on the video IF response curve.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 24.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A9	Adjust for zero beat between the markers on the response curve.
				(See above)				
			207MC (10MC SWP)	205.25MC 24.75MC	12		A10	
			201MC (10MC SWP)	199.25MC 24.75MC	11		A11	
			195MC (10MC SWP)	193.25MC 24.75MC	10		A12	
			189MC (10MC SWP)	187.25MC 24.75MC	9		A13	
			183MC (10MC SWP)	181.25MC 24.75MC	8		A14	
			177MC (10MC SWP)	175.25MC 24.75MC	7		A15	
			85MC (10MC SWP)	83.25MC 24.75MC	6		A16	
			79MC (10MC SWP)	77.25MC 24.75MC	5		A17	
			69MC (10MC SWP)	67.25MC 24.75MC	4		A18	
			63MC (10MC SWP)	61.25MC 24.75MC	3		A19	
			57MC (10MC SWP)	55.25MC 24.75MC	2		A20	

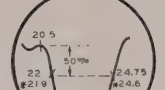


FIG. 1

FIG. 2

FIG. 3

FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT (STANDARD COIL TUNER)

Connect a short across C19A.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors	Across antenna terminal with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A21, A22, A23	Adjust for response curve similar to figure 4, with markers above 90%.
10.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response curve similar to figure 4. If markers fall below 70% on any channel, make slight adjustment of A21, A22, and A23 with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT (SARKES TARZIAN TUNER)

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect an external marker generator, set at 24.75MC, to an ungrounded tube shield slipped over the first video IF amplifier. This marker generator is used to provide a video IF marker on the response curve. The video carrier marker is fed into the set at the antenna and the oscillator is adjusted for zero beat of the markers on the video IF response curve.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A24	Adjust for zero beat between markers on response curve.
12.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	13	"	A25	Check all high band channels to see if the markers can be zeroed within 15° rotation either way from center of the fine tuning control range. If not expand or compress turns of appropriate coil.
			201MC (10MC SWP)	199.25MC 203.75MC	11		A26	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A27	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A28	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A29	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A30	
13.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6		A31	Adjust for zero beat of markers on response curve.
14.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5		A32	Check all low band channels to see if the markers can be zeroed within 15° rotation either way from center of the fine tuning control range. If not expand or compress turns of the appropriate coil.
			69MC (10MC SWP)	67.25MC 71.75MC	4		A33	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A34	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A35	

RF ALIGNMENT (SARKES TARZIAN TUNER)

Connect a short across C19A.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to Point (A).	A36, A37 A38	Adjust for response curve similar to figure 4. In early production tuners, these adjustments are fixed and should not be adjusted in the field.
16.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"	A39, A40 A41	Check all high band channels for response similar to figure 4. If necessary, adjust loops on each channel by moving loop towards, or away from, the wafer. If some channels appear excessively tilted, it may be necessary to make compromise adjustments on the higher channels to obtain best response on all high band channels. When any channel is changed all lower channels will require adjustment.
			201MC (10MC SWP)	199.25MC 203.75MC	11		A42, A43 A44	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A45, A46 A47	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A48, A49 A50	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A51, A52 A53	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A54, A55 A56	
17.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A57, A58 A59	Expand or compress coil turns for response curve similar to figure 4. CAUTION: Adjust only heavy-wire secondary winding of A57.
18.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"	A60, A61 A62	Expand or compress coil turns for response similar to figure 4. Bear in mind that when any channel is adjusted, all lower channels will require adjustment.
			69MC (10MC SWP)	67.25MC 71.75MC	4		A63, A64 A65	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A66, A67 A68	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A69, A70 A71	

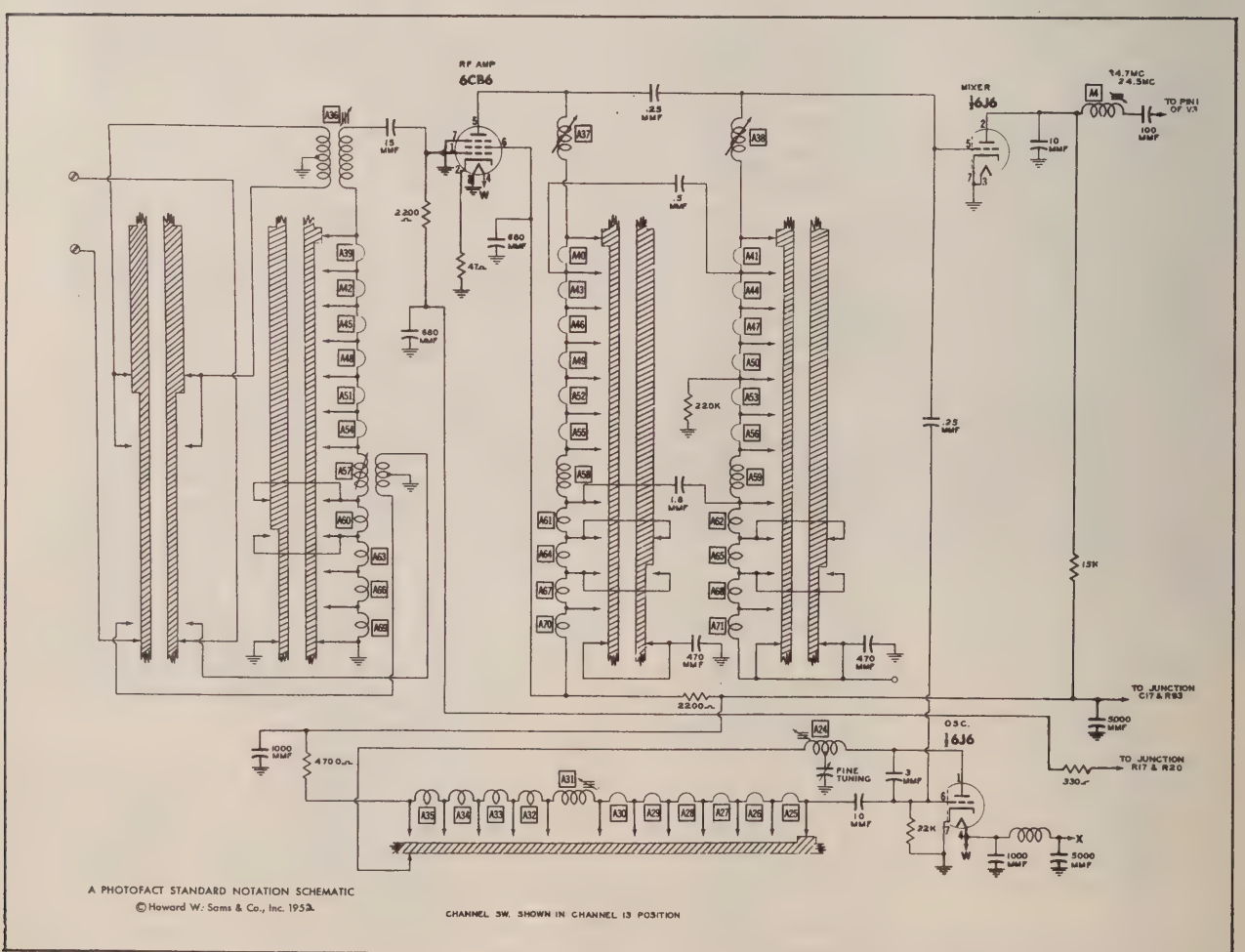
MUNTZ
MODEL 2060

RESISTANCE MEASUREMENTS

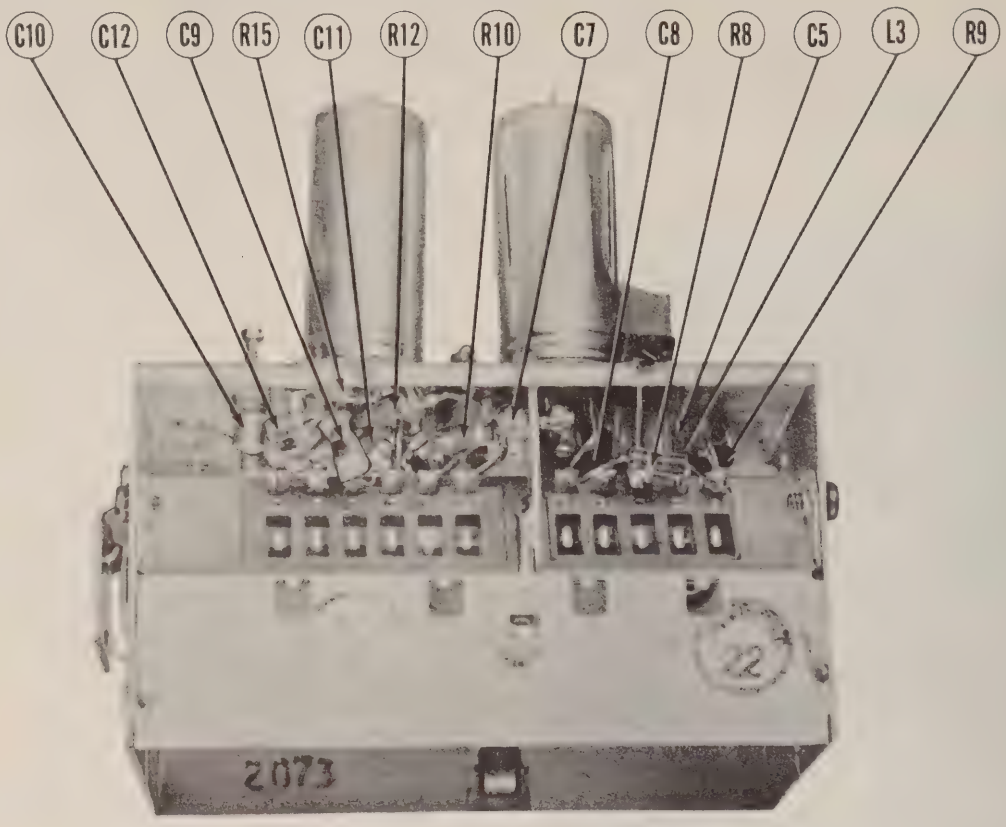
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	935KΩ	0Ω	.1Ω	0Ω	†5KΩ	†5KΩ	0Ω		
V 2	6J6	†9KΩ	†19KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	890KΩ	47Ω	0Ω	.1Ω	†3.4KΩ	†3.4KΩ	0Ω		
V 4	6CB6	890KΩ	47Ω	0Ω	.1Ω	†3.3KΩ	†3.3KΩ	0Ω		
V 5	6AU6	.4Ω	0Ω	0Ω	.1Ω	†3.2KΩ	†3.2KΩ	150Ω		
V 6	6AL5	.4Ω	68KΩ	.1Ω	0Ω	150Ω	0Ω	4.7KΩ		
V 7	12AU7	†5.4KΩ	1Meg	1.3Ω	.1Ω	.1Ω	†16KΩ	4.7KΩ	125Ω	0Ω
V 8	6AU6	47KΩ	0Ω	0Ω	.1Ω	†1.3KΩ	†28KΩ	100Ω		
V 9	6T8	Inf.	18KΩ	Inf.	.1Ω	0Ω	0Ω	0Ω	10Meg	†470KΩ
V 10	6K6GT	Inf.	0Ω	†1.1KΩ	†800Ω	470KΩ	†470KΩ	.1Ω	560Ω	
V 11	6SN7GT	56KΩ	†1.5Meg	220KΩ	†1.5Meg	†8.5KΩ	5600Ω	.1Ω	0Ω	
V 12	6C4	#1.4Meg	0Ω	0Ω	.1Ω	#1.4Meg	1.8Meg	0Ω		
V 13	6V6GT	Inf.	.1Ω	†750Ω	#57KΩ	6.8Meg	2.3KΩ	0Ω	2.6KΩ	
V 14	6SN7GT	1.2Meg	†48KΩ	330KΩ	280KΩ	†49KΩ	0Ω	0Ω	.1Ω	
V 15	6AV5GT	1Meg	.1Ω	0Ω	Inf.	#60Ω	Inf.	0Ω	†5.9KΩ	
V 16	6W4GT	330Ω	Inf.	Inf.	Inf.	†320Ω	■0Ω	■0Ω	■.2Ω	
V 17	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								Top Cap #515Ω
V 18	5U4G	Inf.	36KΩ	Inf.	24Ω	†64Ω	23Ω	†64Ω	36KΩ	
V 19	17AP4A	■0Ω	†5.4KΩ	PIN 10 #470KΩ	PIN 11 †500KΩ	PIN 12 ■.2Ω				

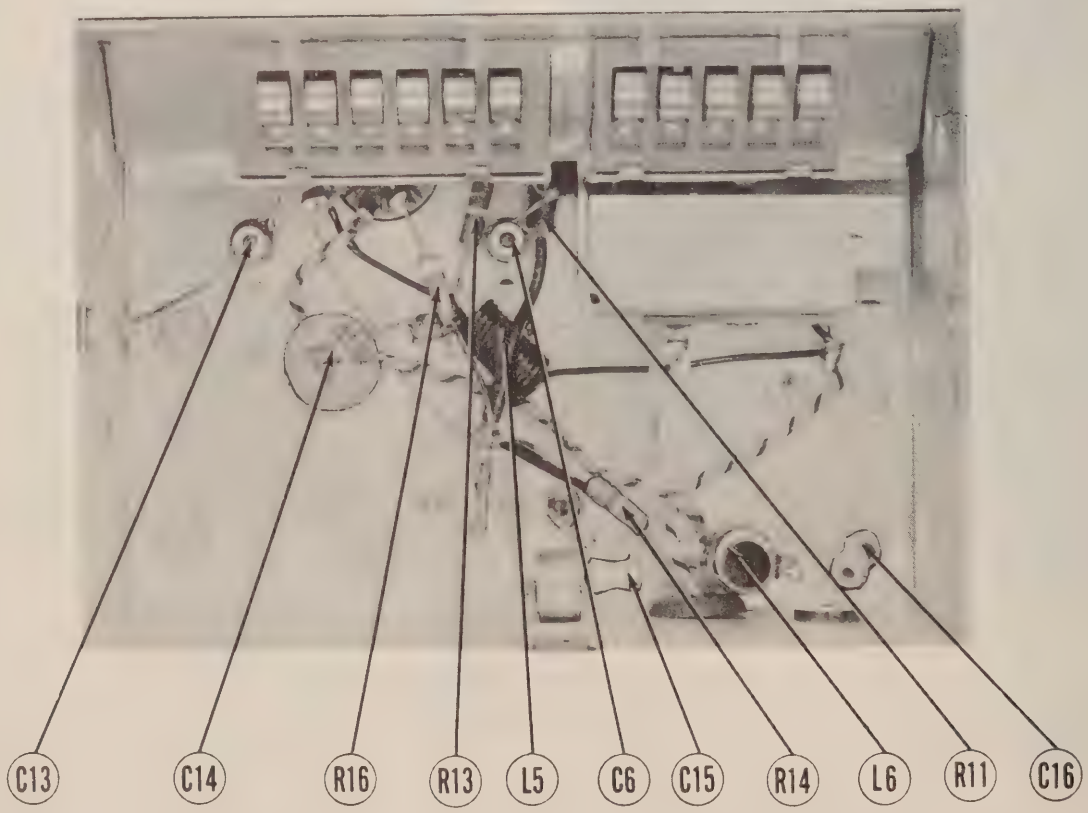
ALL CONTROLS SET FOR NORMAL OPERATION
† MEASURED FROM PIN 8 OF V18
# MEASURED FROM PIN 3 OF V16
■ MEASURED FROM 260VDC LINE



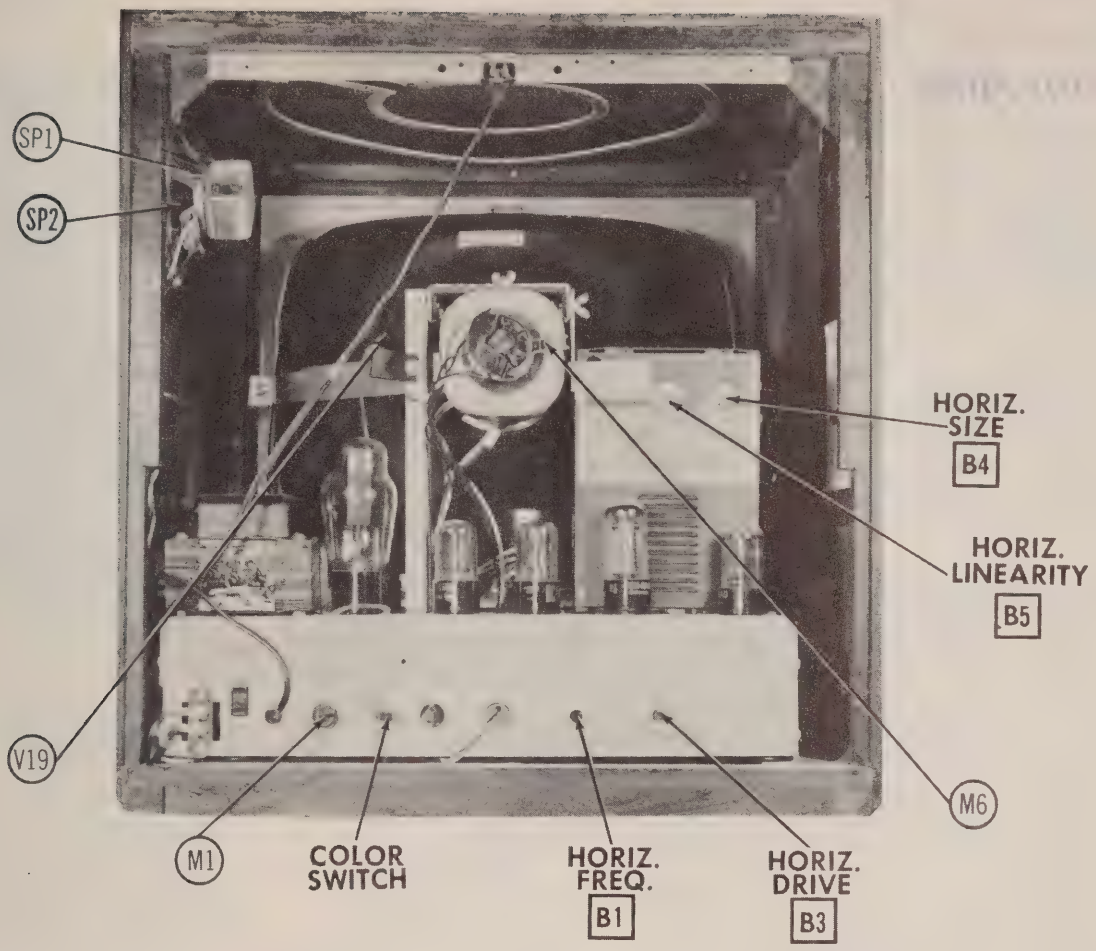
ALTERNATE TUNER SCHEMATIC



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to the mid-position of its range.
Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.
Connect the vertical input lead of an oscilloscope, through a 10KΩ resistor, to terminal C of L17, connect the low side to chassis.
Adjust the horizontal stabilizing core, (B2), until the broad and narrow peaks of the waveform on the scope are of equal height as shown in figure 5. If necessary during adjustment of B2, readjust B1 to keep the picture synchronized.
Adjust the horizontal drive trimmer, (B3), counter-clockwise as far as possible without crowding or bright vertical bars appearing in the picture
Adjust the width slug, (B4), until the picture is slightly wider than necessary to fill the mask horizontally.
Adjust the horizontal linearity slug, (B5), until the picture is symmetrical from left to right.
Since both width and horizontal linearity are effected by the drive trimmer, it may be necessary to adjust B3, B4, and B5 alternately for optimum results.

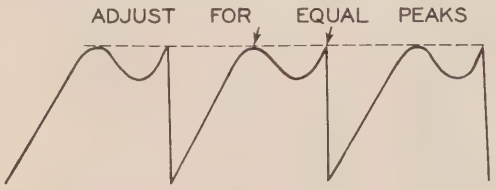


FIG. 5

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove three 1/4" hex head screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove inter-lock switching arrangement.
6. Remove six metal bolts from chassis. Remove chassis.
7. Remove three 1/4" hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: MUNTZ PART No	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6AG5	6AG5	7BD	
B	RF Amplifier	6BC5	6BC5	7BD	
C	RF Amplifier	6CB6	6CB6	7CM	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6AU6	6AU6	7DK	
V6	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Amplifier	12AU7	12AU7	9A	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector-AF Amplifier	6T8	6T8	9E	In some productions a 6AL5 and a 6AT6 or 6AV6 is used in place of V9 (6T8)
V10	Audio Output	6K6GT	6K6GT	7S	
V11	Sync. Separator-Sync. Amplifier	6SN7GT	6SN7GT	8BD	
V12	Vert. Oscillator	6C4	6C4	6BG	
V13	Vert. Output	6V6GT	6V6GT	7AC	
V14	Horizontal AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6AV5GT	6AV5GT	6CK	
V16	Damper	6W4GT	6W4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V19A	17AP4A	17BP4A	12D	
B	20CP4	20CP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MUNTZ PART No	REPLACEMENT DATA: AEROVOX PART No	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	5.435-3	E4D415		UPT420		TVL-3785	▲ Filter ¶
B	40	450						TVA-1703	■ Filter ¶
C	4	450							▲ Audio Output Dec. ††
D	4	450							Decoupling ††
C2A	4	450	5.435-4	AFH3-43		UPT44145		TVL-3785	▲ Decoupling ¶¶
B	40	450							■ Decoupling ¶¶
C	40	450							▲ Decoupling ¶¶
C3A	50	50	5.429-3	AFH3-12		UPT205		TVL-1320	▲ Vert. Output Cathode ¶
B	25	50						TVA-1306	▲ "Audio Output Cathode ¶¶
C4	4	50	C-5.430-1	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C5	3-9				829-10				Variable Trimmer
C6	.5-3				829-3				Variable Trimmer
C7	120			S1120	D6-121		GP2K-121	5GA-T12	RF Amp. Dec.
C8	1000			S11000	D6-102		GP2L-102	5HK-D1	RF Amp. Fil.
C9	100			S1100	D6-101		GP1K-101	5GA-T1	RF Coupling
C10	.5-3				829-3				Variable Trimmer
C11	20				TCN-20		N750K-200		Osc. Grid Cap.
C12	10			S110NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C13	5-3				829-3				Variable Trimmer
C14A	1000			BPD-2X001	DD-2-102		81Z-001	5HK-2D1	Conv. Fil.
B	1000								RF Bypass
C15	10			S110NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C16	120			S1120	D6-121		GP2K-121	5GA-T12	IF Coupling
C17	5000		B-4.115-1	BPD-005	DD-502	(DSD5	81L-005	5HK-D5	RF Bypass
C18A	5000		B-4.125-1	BPD-005	DD-2-502	(DSD5	81L-005	5HK-D5	RF Bypass
B	5000			BPD-005		(DSD5	81L-005	5HK-D5	2nd. Video IF Dec.
C19A	5000		B-4.125-1	BPD-006	DD-2-502	(DSD5	81L-005	5HK-D5	AGC Filter
B	5000			BPD-005		(DSD5	81L-005	5HK-D5	1st. Video IF Dec.
C20	5000		B-4.115-1	BPD-005	DD-502	(DSD5	81L-005	5HK-D5	AGC Filter
C21	.22	400	D-3.105-23	P488-22		GT4P2		4TM-P22	AGC Filter
C22A	5000		B-4.125-1	BPD-005	DD-2-502	(DSD5	81L-005	5HK-D5	3rd. Video IF Dec.
B	5000			BPD-005		(DSD5	81L-005	5HK-D5	3rd. Video IF Cathode
C23	5000		B-4.115-1	BPD-005	DD-502	(DSD5	81L-005	5HK-D5	3rd. Video IF Fil.
C24	100		C-4.109-10	S1100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C25	3.3		C-4.111-5	S13.3NP0	TCZ-3.3		NP0K-3R3		Video Det. Filter
C26	.047	400	D-3.105-19						Video Coupling
C27	.1	500	D-3.105-21	P688-1		DF-104	PTE6P1	6TM-P1	Video Coupling
C28	10	50	C-4.109-16	S110		D6-100	5W5Q1	GP1K-100	5GA-Q1	Fixed Trimmer
C29	39	500	D-4.104-21	1468-00004		D6-390	5W5Q4	GP1K-390	1FM-44	Sound IF Coupling
C30	.01	600	D-3.105-21	P688-01		D6-103	PTE6S1	GP2-333-103	6TM-S1	Sound IF Plate †
C31A	5000		B-4.125-1	BPD-005	DD-2-502	(DSD5	81L-005	5HK-D5	Sound IF Screen
B	5000			BPD-005		(DSD5	81L-005	5HK-D5	Sound IF Cathode
C32	1500		D-4.108-12	S11500	D6-152	1W5D15	GP2L-152	5HK-D15	RF Bypass
C33	1500		D-4.108-12	S11500	D6-152	1W5D15	GP2L-152	5HK-D15	De-emphasis
C34	.01	600	D-3.105-1	P688-01		D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling †
C35	.01	600	D-3.105-1	P688-01		D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling †
C36	680		C-4.109-5	S1680		5W5T7	GP2K-681	5GA-T68	AF Amp. Grid
C37	.01	600	D-3.105-1	P688-01		D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling ††
C38	.0047	600	B-4.115-1	P688-0047		D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Output Plate
C39	.22	400	D-3.105-23	P488-22		GT4P2		4TM-P22	Sync. Coupling
C40	220		C-4.109-11	S1220		5W5T25	GP2K-221	5GA-T22	Sync. Sep. Cathode
C41	.0022	600	D-3.105-26	P688-0022		D6-222	PTE6D2	GP2-333-222	6TM-D22	Sync. Sep. Grid
C42	.022	400	D-3.105-17	P488-022		DF-203	PTE6S3		4TM-S22	Sync. Amp. Cathode
C43A	.002			P688-002			PTE6D2	GP2-333-202		Vert. Integrator Net.
B	.005			P688-005		ePC-100	PTE6D5	GP2-333-502	401C1	Vert. Integrator Net.
C	.005			P688-005			PTE6D5	GP2-333-502		Vert. Integrator Net.
C44	4700	500	D-4.105-24	1464-005			1DR5D4		MS-25	Vert. Osc. Grid Cap.
C45	.047	600	D-3.105-34							Vert. Discharge
C46	.1	600	D-3.105-38	P688-1		DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C47	.25	600	D-3.100-32	604-25			GP6P25		6TM-P25	Vert. Output Plate

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C48	.1	600	D-3.105-36	P688-1	DF-104	PTE6P1		6TM-P1	Fixed Trimmer
C49	.1	600	D-3.105-36	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C50	.22	400	D-3.105-33	P488-22		GT4P2		4TM-P22	Integrator Net.
C51	.047	600	D-3.105-34						Decoupling
C52	68	500	D-3.104-13	1469-00007		5R5Q7		MS-47	Horiz. Sync. Coupling
C53	47		C-4.109-14	S147NP0	TCZ-47		NP0L-470	5TCC-Q47	Voltage Divider
C54	47		D-4.109-12	S147	D6-470	5W5Q5	GP1K-470	5GA-Q47	Horiz. Feedback
C55	.0022	600	D-3.105-26	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Horiz. Sync. Coupling
C56	022	400	D-3.105-17	P188-022	DF-202	PTE4S2		4TM-S22	AFC Filter
C57	25	200	D-3.100-30	P488-25		GT2P25		2TM-P25	AFC Filter
C58	.047	400	D-3.105-19						AFC Plate
C59	500	500	D-4.105-50	1469-00035					Horiz. Osc. Grid Cap.
C60	.01	600	D-3.106 1	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Trimmer
C61	1200	500	D-4.105-9						Horiz. Discharge
C62	560	300	D-4.104-70						Horiz. Sweep Coupling
C63	.047	600	D-3.105-34						Horiz. Output Screen
C64	.25	200	D-3.100-30	P488-25		GT2P25		2TM-P25	Horiz. Sweep Coupling
C65	39	2000	B-4.128-4						Horiz. Sweep Coupling
C66	68	2000	B-4.128-4						Voltage Divider
C67	.047	600	D-3.105-34						Damper Filter
C68	.035	600	D-3.100-46						Damper Filter
C69	500	20000	B-4.128	HV20C	TV3-502				HV Filter
C70	5000		B-4.115-4	BPD-005	DD-502	1DSD5	81L-005	5HK-D5	Line Filter
C71	5000		B-4.115-1	BPD-005	DD-502	1DSD5	81L-005	5HK D5	Line Filter
C72	4.7		C-4.111-6	S14.7NP0	TCZ-4.7		NP0K-4R7		Fixed Trimmer
C73	1500		D-4.108-12	S11500	D6-152	1W5D15	GP2L-152	5HK-D15	Fixed Trimmer

† Some models use 5000MMF. in this application. (Part # B-4.115-1)
‡ Some models use .047MFD. in this application. (Part # D-3.105-19)
†† Some models use .022MFD. in this application. (Part # D-3.105+17)
¶ Some models combine C1A, C1B and C3A in one unit. (Part # 5.435-1)
¶¶ Some models combine C2A, C2B, C2C and C3B in one unit. (Part # 5.435-2)
‡‡ Some models use cardboard tubulars in this application. (Part # 5.418)
♦ Items C43A, C43B, C43C, R64A, R64B, R64C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	1500Ω	½	C-8.230-1	(Concentrikit B11-109 † B13-137 † E-187 † 76-1	RTV-233		Contrast Control-Panel
B	1Meg	½					Volume Control and Switch - Rear
C	Shaft end						Attach per instructions in Concentrikit.
D	Switch						Attach per instructions in Concentrikit.
R2	22500	4	C-8.221		RTV-9		Focus Control - Wire Wound
R3A	1Meg	½	C-8.228-9	PQ13-137	AG-63-Z	B-70	Vertical Hold Control
B	Shaft		Not req.	Not req.	RS-2	Not req.	Attach to R3A per instructions
R4	5000Ω	2	C-8.206-5		43-5000		Vertical Linearity Control - Wire Wound
R5A	100KΩ	½	C-8.228-9	PQ11-126	AG-49-S	B-40	Brightness Control
B	Shaft		Not req.	Not req.	RS-2	Not req.	Attach to R5A per instructions
R6A	2.5Meg	½	C-8.219-5	Q11-239	AG-84-S	AN-83	Vertical Size Control
B	Shaft		Not req.	Not req.	RS-2	Not req.	Attach to R5A per instructions
R7A	50KΩ	½	C-8.229-7	PQ13-123	AG-46-Z	B-32	Horiz. Hold Control
B	Shaft		Not req.	Not req.	RS-2	Not req.	Attach to R7A per instructions

† Additional parts to be used with Concentrikit.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R8	3900Ω	½		BTS-3900	Antenna Coil Shunt
R9	47KΩ 20%	½		BTS-47K	AGC Network
R10	10KΩ 20%	½		BTS-10K	RF Coil Shunt
R11	2200Ω	½		BTS-2200	RF Amp. Decoupling
R12	4700Ω	½		BTS-4700	Mixer Grid
R13	220KΩ	½		BTS-220K	Mixer Grid
R14	15KΩ	½		BTS-15K	Mixer Plate
R15	10KΩ	½		BTS-10K	Osc. Grid
R16	4700Ω	½		BTS-4700	Osc. Plate
R17	4700Ω	½	D-7.101-44	BTS-4700	1st. Video IF Amp. Grid
R18	47Ω 20%	½	D-7.101-240		1st. Video IF Amp. Cathode
R19	100Ω	½	D-7.101-226	BTS-100	1st. Video IF Amp. Decoupling
R20	330Ω 20%	½	D-7.101-237	BTS-330	AGC Network
R21	8200Ω	½	D-7.101-55	BTS-8200	2nd. Video IF Transformer Shunt
R22	47Ω 20%	½	D-7.101-240		2nd. Video IF Amp. Cathode
R23	100Ω	½	D-7.101-226	BTS-100	Decoupling
R24	10KΩ	½	D-7.101-58	BTS-10K	3rd. Video IF Amp. Grid
R25	150Ω	½	D-7.101-204	BTS-150	3rd. Video IF Amp. Cathode
R26	100Ω	½	D-7.101-226	BTS-100	Decoupling
R27	820KΩ	½	D-7.101-138	BTS-820K	AGC Network
R28	68KΩ	½	D-7.101-92	BTS-68K	AGC Rectifier Diode Load
R29	12KΩ	½	D-7.101-62	BTS-12K	Peaking Coil Shunt
R30	4700Ω	½	D-7.101-44	BTS-4700	Video Detector Diode Load
R31	100Ω	½	D-7.101-226	BTS-100	Video Detector Cathode
R32	8200Ω	½	D-7.101-55	BTS-8200	Peaking Coil Shunt
R33	3300Ω	½	D-7.101-37	BTS-3300	Video Amp. Plate
R34	33KΩ	½	D-7.101-80	BTS-33K	Voltage Divider
R35	22KΩ	½	D-7.103-143	BTS-22K	Video Amp. Plate Decoupling
R36	1Meg 20%	½	D-7.101-42	BTS-1Meg	Video Amp. Grid
R37	8200Ω 5%	1	D-7.101-55	BTS-8200	Peaking Coil Shunt
R38	1800Ω	1	D-7.102-34	BTA-1800	Video Amp. Plate
R39	3300Ω	2	D-7.103-108	BTS-3300	Video Amp. Plate
R40	470KΩ	½	D-7.101-129	BTS-470K	Picture Tube Cathode
R41	470KΩ	½	D-7.101-129	BTS-470K	Acc. Anode Load
R42	47KΩ	½	D-7.101-87	BTS-47K	Voltage Divider
R43	47KΩ	½	D-7.101-87	BTS-47K	Sound IF Amp. Grid
R44	100Ω	½	D-7.101-226	BTS-100	Sound IF Amp. Cathode
R45	47KΩ	½	D-7.101-87	BTS-47K	Sound IF Amp. Screen
R46	1000Ω 5%	½	D-7.101+17	BTS-1000	Sound IF Amp. Plate Decoupling
R47	47KΩ	½	D-7.101-87	BTS-47K	Voltage Divider
R48	18KΩ 5%	½	D-7.101-69		Ratio Detector Diode Load
R49	220Ω 20%	½	D-7.101-234	BTS-220	Balancing

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R50	15KΩ 20%	½	D-7.101-66	BTS-15K	De-emphasis
R51	10Meg 20%	½	D-7.101-197	BTS-10Meg	AF Amp. Grid
R52	470KΩ 10%	½	D-7.101-129	BTS-470K	AF Amp. Plate
R53	470KΩ	½	D-7.101-129	BTS-470K	Output Grid
R54	560Ω	1	D-7.102-13	BTA-560	Output Cathode
R55	470Ω	1	D-7.102-10	BTA-470	Output Decoupling
R56	3300Ω	½	C-7.101-38	BTS-3300	Isolation
R57	275Ω	10	B-6.211-4		Decoupling
R58	56KΩ	½	D-7.101-90	BTS-56K	Sync. Separator Grid
R59	220KΩ	½	D-7.101-114	BTS-220K	Sync. Separator Cathode
R60	1.5Meg	½	D-7.101-148	BTS-1.5Meg	Sync. Separator Plate
R61	33KΩ	½	D-7.101-48	BTS-3300	Sync. Amp. Cathode
R62	1800Ω 20%	½	D-7.101-27	BTS-1800	Sync. Amp. Plate
R63	3300Ω 20%	½	D-7.101-38	BTS-3300	Sync. Amp. Plate
R64A	22KΩ	½		BTS-22K	Integrator Network
B	8200 Ω	½	10.101 ♦	BTS-8200	Integrator Network
C	8200 Ω	½		BTS-8200	Integrator Network
R65	1.5MeG	½	D-7.101-148	BTS-1.5Meg	Vertical Osc. Grid
R66	220KΩ	½	D-7.101-115	BTS-220K	Vertical Osc. Grid - See Note 1
R67	470KΩ 20%	½	D-7.101-129	BTS-470K	Vertical Osc. Plate
R68	8200Ω	½	D-7.101-55	BTS-8200	Vertical Peaking
R69	6.8Meg 20%	½	D-7.101-185	BTS-6.8Meg	Vertical Output Grid
R70	220Ω 20%	½	D-7.101-234	BTS-220	Vertical Output Cathode
R71	47KΩ 20%	½	D-7.102-94	BTA-47K	Vertical Output Screen
R72	10KΩ	½	D-7.101-59	BTS-10K	Voltage Divider
R73	1000Ω	1	D-7.102-24	BTA-1000	Decoupling
R74	3.3Meg	½	D-7.101-171	BTS-3.3Meg	Horiz. Feedback
R75	47KΩ	1	D-7.102-94	BTA-47K	AFC Plate
R76	100KΩ	1	D-7.102-108	BTA-100K	Voltage Divider - See Note 2
R77	820KΩ	½	D-7.101-138	BTS-820K	AFC Filter
R78	8200Ω	½	D-7.101-55	BTS-8200	AFC Filter
R79	150KΩ	½	D-7.101-107	BTS-150K	AFC Filter
R80	100KΩ	½	D-7.101-99	BTS-100K	Horiz. Osc. Grid
R81	8200Ω	½	D-7.101-55	BTS-8200	Horiz. Osc. Coil Shunt
R82	180KΩ	½	D-7.101-111	BTS-180K	Voltage Divider
R83	47KΩ 20%	½	D-7.102-94	BTA-47K	Horiz. Osc. Plate
R84	470KΩ	½	D-7.101-129	BTS-470K	Horiz. Feedback
R85	82Ω	½			Parasitic Suppressor - See Note 3
R86	1Meg	½	D-7.101-142	BTS-1Meg	Horiz. Output Grid
R87	5600Ω	2	D-7.103-118	BTS-5600	Horiz. Output Screen - See Note 2
R88	3.3Ω	½	C-6.212-1		HV Filament - Wire Wound
R89	470KΩ	1	D-7.102-137		HV Filter
R90	1800Ω	2	D-7.103-97	BTB-1800	Focus Coil Shunt
R91	470Ω	10	C-6.215-5		Focus Coil Shunt
R92	100KΩ	½	D-7.101-100	BTS-100K	Line Isolation
R93	100Ω	½	D-7.101-226	BTS-100	Decoupling

♦ Items R64A, R64B, R64C, C43A, C43B, C43C, are combined in one unit.
Note 1 Not used in all models.
Note 2 Some models use resistors in parallel to obtain desired value.
Note 3 Some models use 100Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ④ 1.8A	800VCT ⑤ 220ADC	5VAC ⑤ 3A	6.3VAC ⑥ 1.8A 6.3VAC ⑥ 5A	D-9252	P6315① & P5014②	P-3070

① Add series resistor to reduce plate voltage if necessary.
② Mount beneath chassis where space permits.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	160Ω	1.3KΩ	C-9.230-4				Vert. Block Osc. Trans.
T3	495Ω Tap 42Ω	22Ω Tap 17Ω SEC. 2 0Ω	C-9.353-1-2				Horiz. Output Trans.
T4	700Ω	7.5Ω	C-9 228-5	A-8112	A-3036	TSO-5 ③	Vert. Output Trans.
T5A	18Ω		C-9.254-3	DY-8	MDF-70		Horiz. Deflection Coils
B	64Ω						Vert. Deflection Coils
T6	310Ω		C-9234-4		FC-10	MF-3	Focus Coil

③ Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MUNTZ PART No	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T7	7.8KΩ	4 Ω	450Ω	1Ω	C-9225-5C	A-3020 ④	RO-16 ⑤	RO-16 ⑤	④ Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	MUNTZ PART No.	VIKING PART No.	QUAM PART No.	
SP1A	PM	3-4Ω	E30.326 ④	5J4	5A1	④ Used in table models.
B	PM	3-4Ω	C30.328 ⑤	10J12	10A4A	⑤ Used in console models.
	CONE DIA.	V. C. DIA.				
SP2A	5"	9/16"				
B	10"	1"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∽)	MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.200A	64Ω	3.2Henries	C-9.237-3	C-2325 ③	C-2974 ③	TR4200 ③	③ Drill one new mounting hole.

COILS (RF-IF)

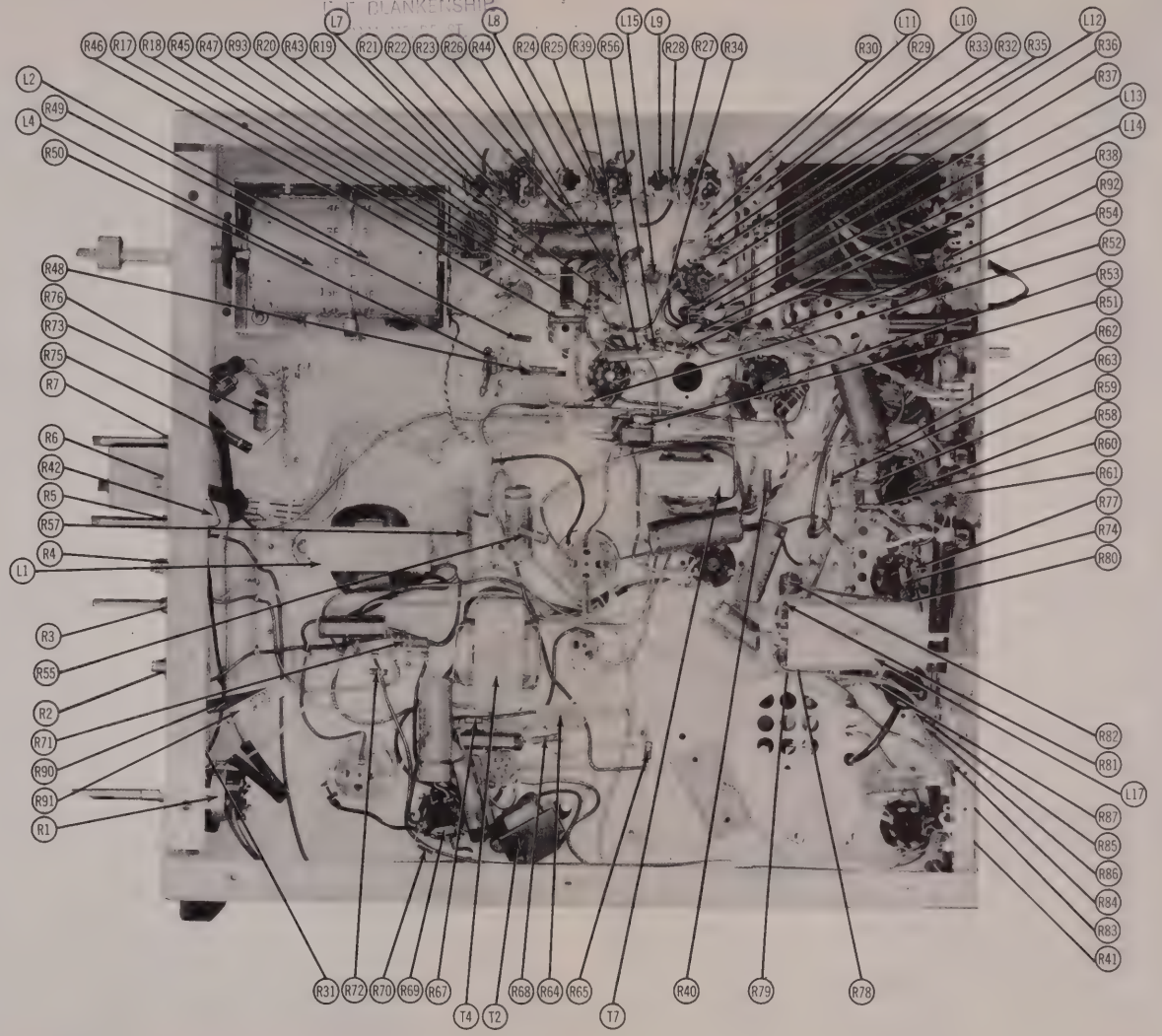
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MUNTZ PART No.		
L2	Ant. Coil	0Ω	0Ω	B-36.141-2		Channel # 2
L3	Fil. Choke	0Ω				Part of Tuner Part # D-36.137-2
L4	RF, Mixer Grid & Osc. Coils	0Ω		B-36.141-102		Channel # 2
L5	Fil. Choke	0Ω				
L6	1st. Video IF	.9Ω				
L7	2nd. Video IF	.4Ω	.4Ω	C-1.476		
L8	3rd. Video IF	.4Ω	.4Ω	C-1.476		
L9	4th. Video IF	.4Ω	.4Ω	C-1.476		
L10	Peaking	8Ω		C-1.522-3		Blue Dot
L11	Peaking	6.8Ω		C-1.522-4		Yellow Dot
L12	Peaking	6.8Ω		C-1.522-4		Yellow Dot
L13	Peaking	6.8Ω		C-1.522-4		Yellow Dot
L14	Peaking	6.8Ω		C-1.522-4		Yellow Dot
L15	Sound IF	3.5Ω		C-1.529-2		Tap 2.2Ω
L16	Ratio Det. Trans.	4Ω	1.2Ω	C-1.528-1		Tap 1.2Ω
L17	Horiz. Osc.	130Ω	36Ω	B-1.549		
L18	Horiz. Size	31Ω		B-1.553-1		
L19	Horiz. Lin.	21Ω		B-1.531		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			MUNTZ PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	3A		B-36.131	312003	341001	
M2	3AG Pigtail	.250A			318.250		

MISCELLANEOUS

ITEM No.	PART NAME	MUNTZ PART No.	NOTES
M3A	RF Tuner	D-36.137-2	
B	RF Tuner	E-36.143	Alternate
M4	Switch		Color
M5	Switch		TV-Phono
M6	Ion Trap		
B3	Trimmer	B-4.119-2	40-370MMF. (Horiz. Drive)
	Ant. Coil	B-36.141-3	Channel # 3
		B-36.141-4	Channel # 4
		B-36.141-5	Channel # 5
		B-36.141-6	Channel # 6
		B-36.141-7	Channel # 7
		B-36.141-8	Channel # 8
		B-36.141-9	Channel # 9
		B-36.141-10	Channel # 10
		B-36.141-11	Channel # 11
		B-36.141-12	Channel # 12
		B-36.141-13	Channel # 13
	RF, Mixer Grid & Oscillator Coil	B-36.141-103	Channel # 3
		B-36.141-104	Channel # 4
		B-36.141-105	Channel # 5
		B-36.141-106	Channel # 6
		B-36.141-107	Channel # 7
		B-361141-108	Channel # 8
		B-36.141-109	Channel # 9
		B-36.141-110	Channel # 10
		B-36.141-111	
		B-36.141-112	
		B-36.141-113	



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

*TRADE MARK

NORELCO
MODEL 588A

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

NORELCO
MODEL 588A

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

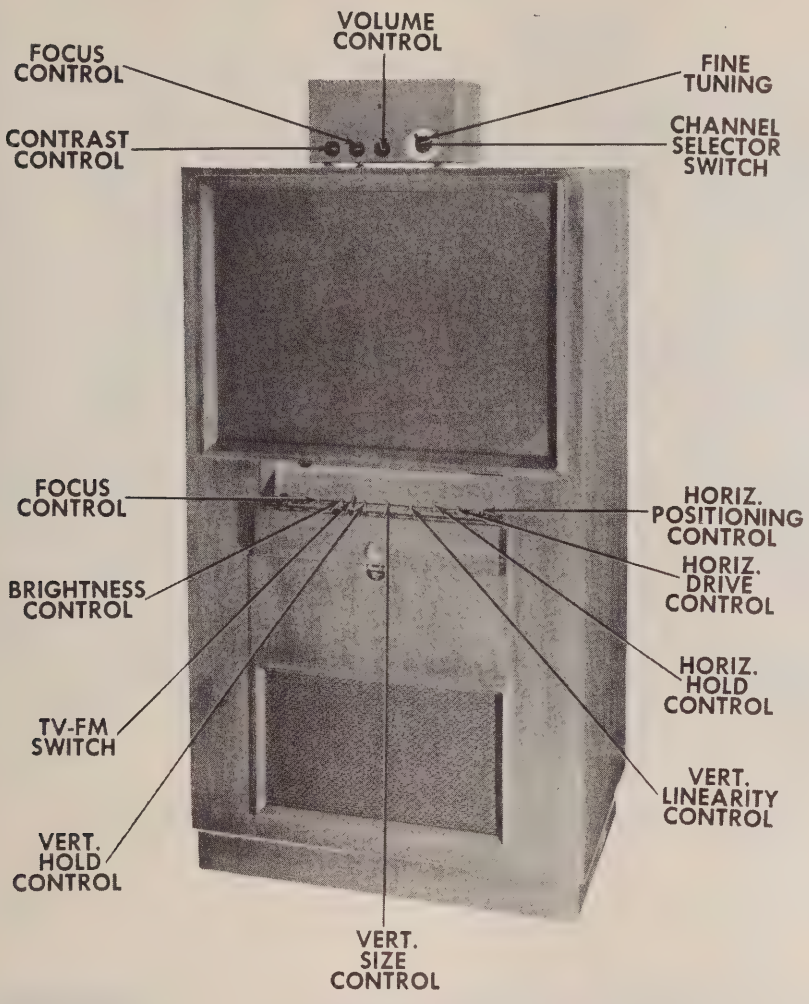
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 4–52 SET 164 FOLDER 7

PROPERTY OF
F. TELEVISION
3924
DENVER, COLORADO

NORELCO
MODEL 588A

PROPERTY OF
L. F. [illegible]
DENVER



NORELCO
MODEL 588A

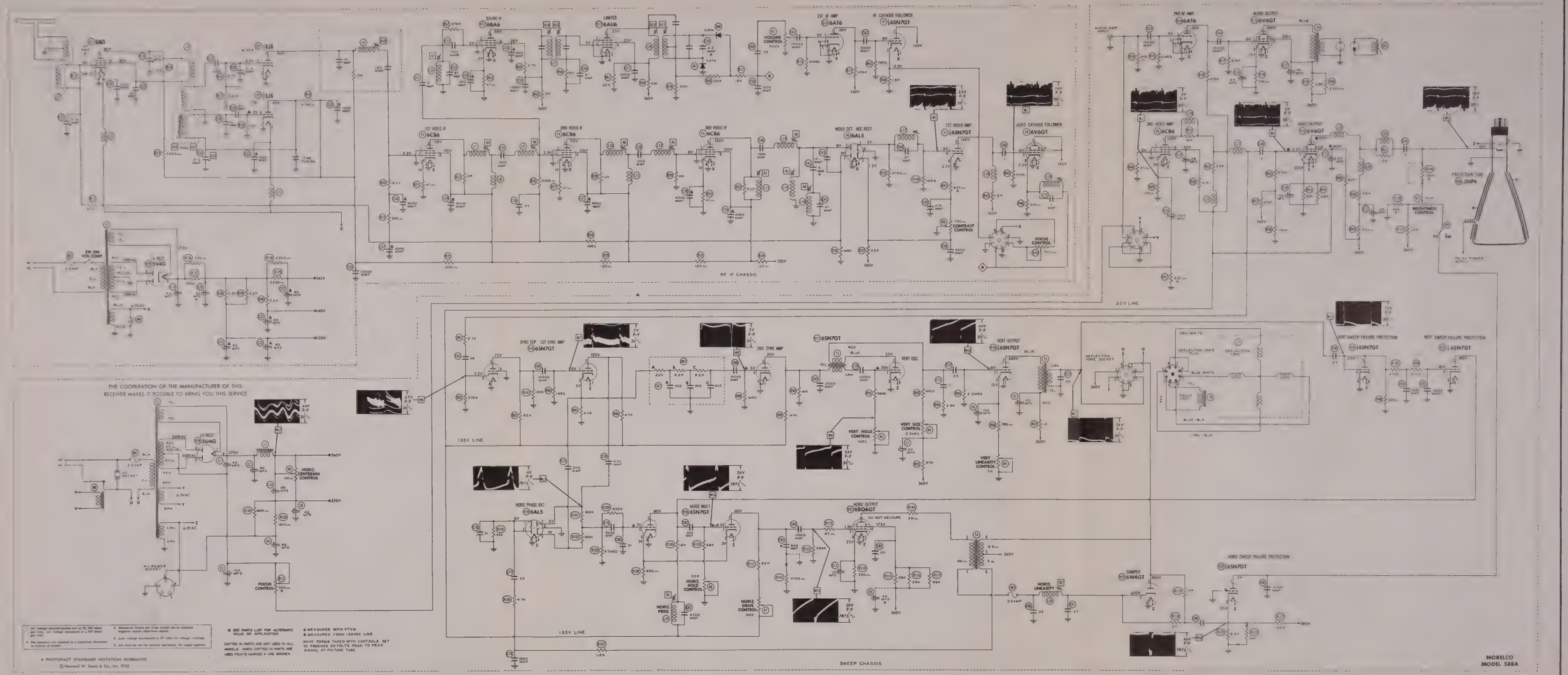
TRADE NAME	Norelco Model 588A
MANUFACTURER	North American Philips Co., Inc., Mount Vernon, N.Y.
TYPE SET	Projection Type Television Receiver
TUBES	Thirty
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 2.8Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

INDEX

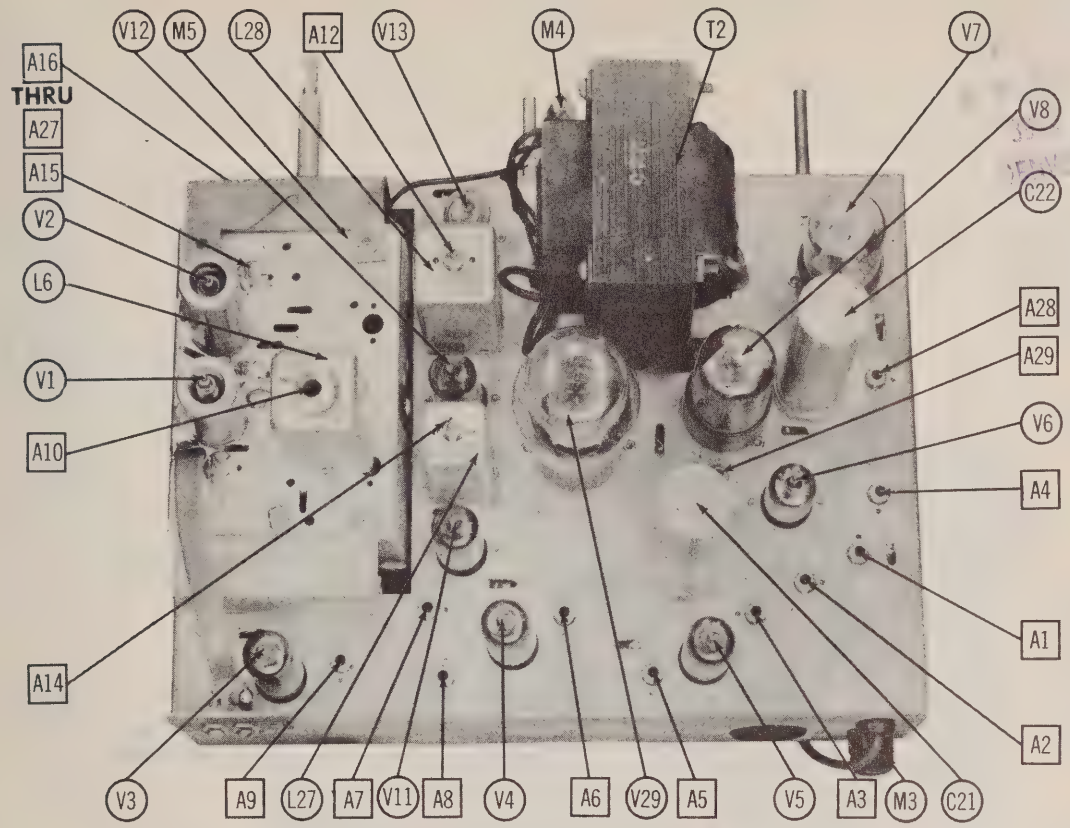
Alignment Instructions 6
Disassembly Instructions 7
Horizontal Sweep Circuit Adjustments 19
Optical Adjustments 7
Parts List and Descriptions 13, 14, 15, 16
Photographs
Chassis - Bottom View (Sweep) 12, 17
Chassis - Bottom View (Tuner IF) 4, 9
Chassis - Top View 3
Photographs (cont.)
H.V. Supply 11
Optical Unit 18
RF Tuner 10
Resistance Measurements 8
Schematic (H.V. Supply) 18
Schematic (TV) 2
Tube Placement Charts 5

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

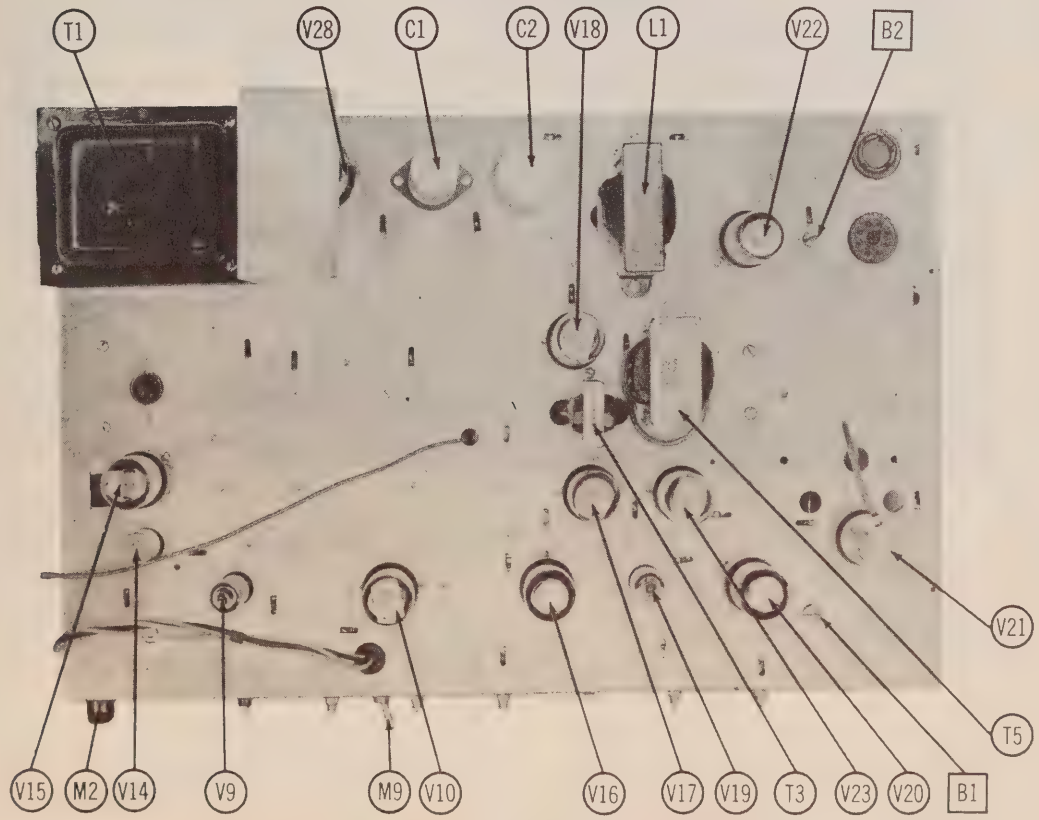
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
RF IF CHASSIS
SWEEP CHASSIS
135V LINE
35V LINE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1952
NORELCO MODEL 588A

NORELCO MODEL 588A

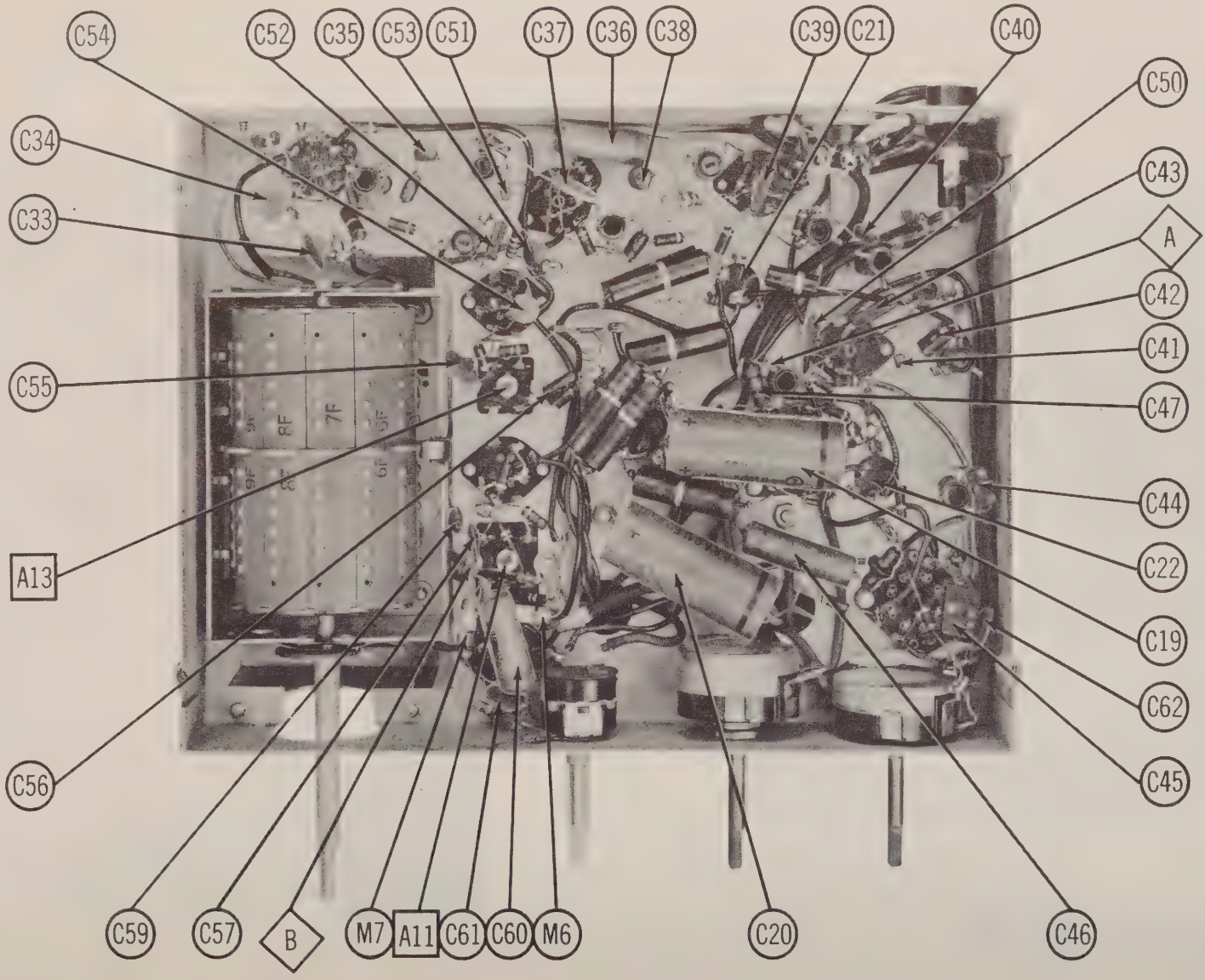


TUNER IF CHASSIS–TOP VIEW



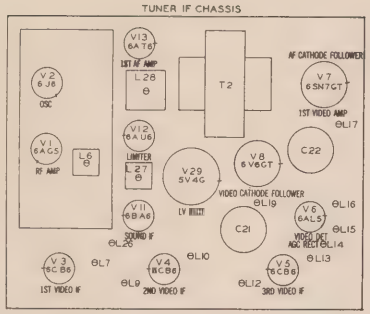
SWEEP CHASSIS–TOP VIEW

NORELCO
MODEL 588A

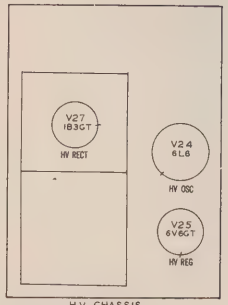


TUNER-IF CHASSIS-BOTTOM

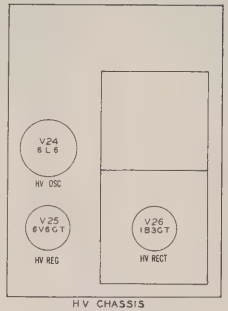
TUBE PLACEMENT CHART



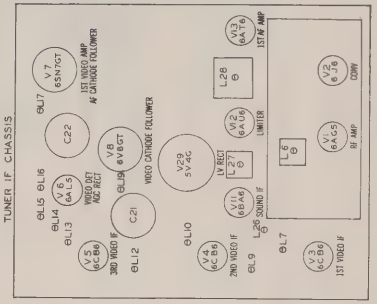
TOP VIEW



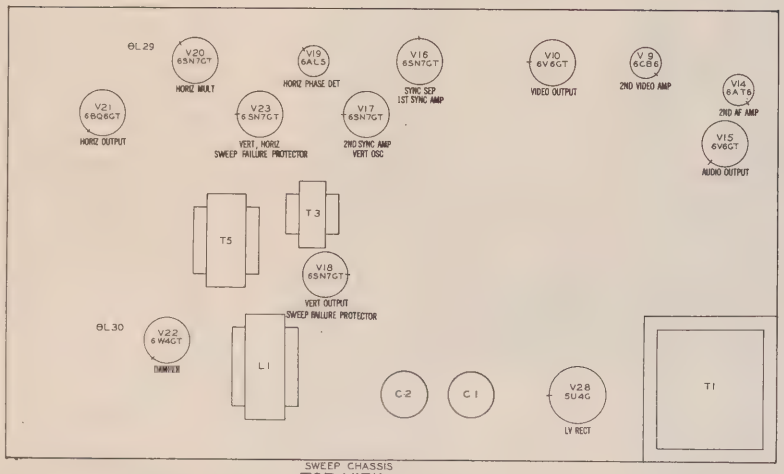
HV CHASSIS
TOP VIEW



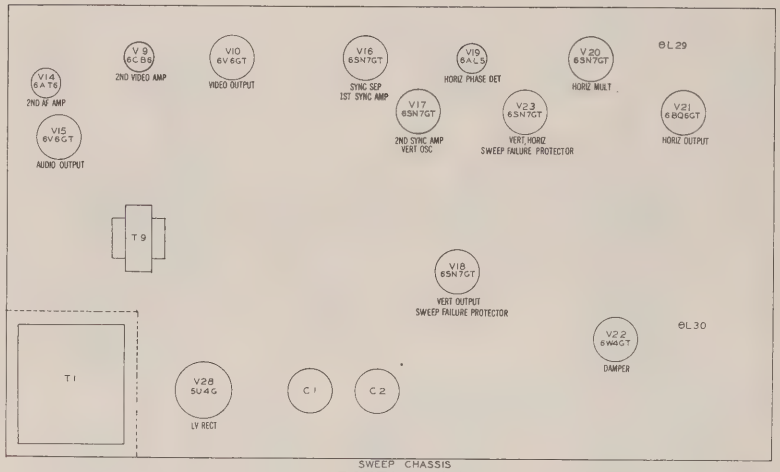
HV CHASSIS
BOTTOM VIEW



BOTTOM VIEW



SWEEP CHASSIS
TOP VIEW



SWEEP CHASSIS
BOTTOM VIEW

PROPERTY OF
L. F. TELEVISION SHOP
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Since the Tuner IF chassis contains its own power supply it may be operated separately for alignment.

VIDEO IF ALIGNMENT

Remove the converter tube and replace it with a 6J6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C36, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to pin 1, (grid) of 6CB6, (V5). Low side to chassis.	23 MC (10MC Swp)	21.25MC 25MC 25.75MC	Any	Vert. Amp. to point (A). Low side to chassis.	A1, A2, A3	Turn A1 until core is centered in coil. Adjust A2 & A3 for response curve similar to Fig. 1.
2.	"	"	"	21.25MC	"	"	A4	Adjust for MINIMUM marker indication at the 21.25MC point on response curve.
3.	"	High side to pin 1, (grid) of 3BA6, (V4). Low side to chassis.	"	21.25MC 23MC 25MC 25.75MC	"	"	A5, A6	Adjust for response curve similar to fig. 2.
4.	"	High side to pin 1, (grid) of 6CB6, (V3). Low side to chassis.	"	"	"	"	A7	Adjust for MINIMUM marker indication at the 21.25MC point on response curve.
5.	Direct	"	"	"	"	"	A8, A9	Adjust for response curve similar to fig. 3.
6.	"	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	"	21.25MC 23MC 25MC 25.75MC	"	"	A10	Adjust for response curve similar to fig. 4.

AFTER SET IS RESTORED TO ORIGINAL OPERATION TUNE IN A STRONG STATION. IF EVIDENCE OF RINGING IS PRESENT RETOUCH A10 TO ELIMINATE IT.

SOUND IF ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	1000MMF	High side to pin 1, (grid) of 6AU6, (V12). Low side to chassis.	21.25MC (450KC Swp)	21.25MC	Any	Vert. Amp. to point (B). Low side to chassis.	A11, A12	Adjust A11 so 21.25MC occurs at center of "S" curve as shown in fig. 5. Adjust A12 for max. amplitude of curve with symmetrical peaks.
8.	"	High side to pin 1, (grid) of 6BA6, (V11). Low side to chassis.	"	"	"	"	A13, A14	Adjust for maximum amplitude of response curve. If necessary SLIGHTLY retouch A10 and A11 for symmetrical response.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A15. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A15 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	215.75MC (unmod)	13	DC probe to point (B). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
		209.75MC	12			A17	
		203.75MC	11			A18	
		197.75MC	10			A19	
		191.75MC	9			A20	
		185.75MC	8			A21	
		179.75MC	7			A22	
		87.75MC	6			A23	
		81.75MC	5			A24	
		71.75MC	4			A25	
		65.75MC	3			A26	
		59.75MC	2			A27	

THE RF PORTION OF THIS TUNER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

VIDEO TRAP ADJUSTMENT

After alignment is completed and set is restored to original operation, tune in a strong signal and adjust the fine tuning until sound just begins to appear in the picture. Examine the picture for 4.5MC beat interference, (grain appearance in horizontal lines). If interference is encountered adjust A28 to eliminate or minimize the interference.
Turn the channel selector to channel 5 and examine the picture for RF interference similar to that caused by FM interference. If RF interference is present adjust A29 to eliminate it.

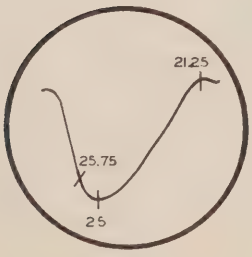


FIG.1

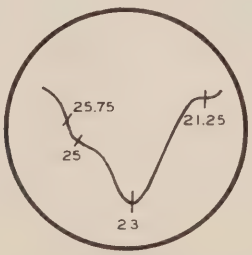


FIG.2

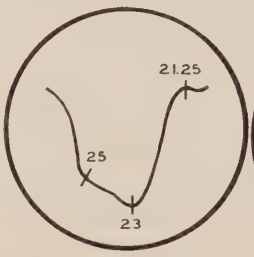


FIG.3

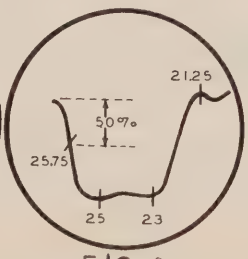


FIG.4

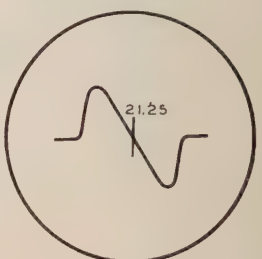
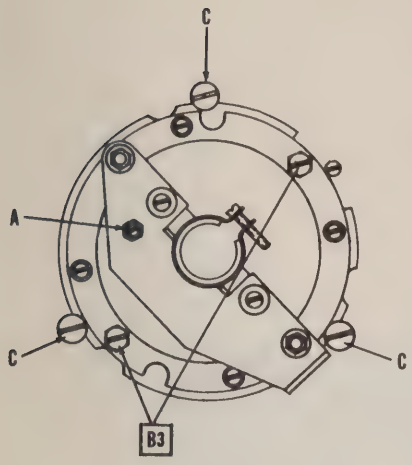
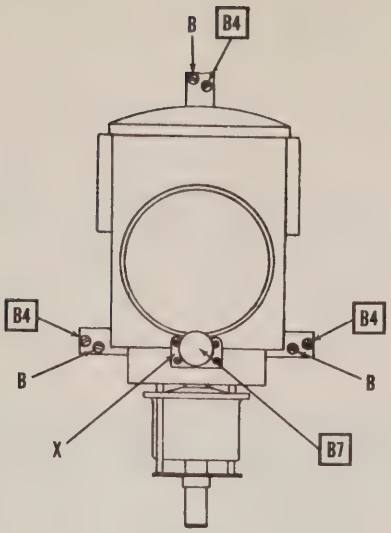
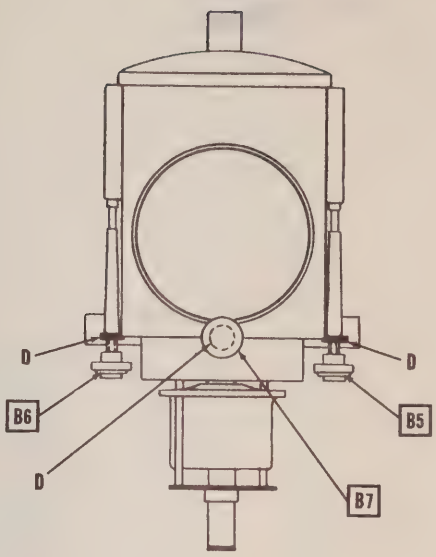


FIG.5







OPTICAL ADJUSTMENTS

It is important that all electrical adjustments, especially focus, be correct before attempting any optical adjustments, since no amount of optical adjustments can compensate for incorrect electric adjustments.

Make sure the red shipping clamp "X" under the vertical focus knob, (B7), is removed before making the optical adjustments.

Do not apply pressure to the focus assembly; to do so may break the focus coil support bracket.

Loosen the focus coil lock nut and screw "A" and adjust the centering screws, (B3), until the corners of the picture just touch the edge of the picture tube face. Tighten the lock screw and lock nut "A".

If the picture is not centered on the viewing screen, loosen the mounting feet lock bolts "B" and adjust the optical unit tilt adjustment screws, (B4), until the projected picture is centered on the viewing screen.

If the projected picture is tilted with respect to the viewing screen edges, loosen the tube mount locknuts "C" and rotate the entire assembly until the picture is aligned with the edges of the viewing screen.

Loosen the focus adjustment locknuts "D".

Adjust the horizontal focus adjustment, (B5), until a horizontal line on the right side of the view screen, (viewed from front), is focused through the center of the picture.

Adjust the focus adjustment, (B6), until the same horizontal line is focused from the left side of the view screen through the center of the picture. Repeat the adjustments of B5 and B6 until the horizontal line is focused all the way across the picture.

Adjust the vertical focus adjustment, (B7), until all the lines in the picture from top to bottom are focused.

Hand tighten locknuts "D".

All other adjustments on the projections unit should not be adjusted in the field.

DISASSEMBLY INSTRUCTIONS

REMOTE UNIT (TUNER-IF CHASSIS)

1. Remove 5 push-on type control knobs from front panel.
2. Remove 2 metal screws and remove metal strip across rear of unit.
3. Remove 4 chassis bolts. Remove chassis.

SWEEP CHASSIS

1. Disconnect projection tube base socket.
2. Disconnect power supply, deflection and speaker plugs from chassis.
3. Remove 4 chassis bolts. Remove chassis.
4. Remove 4 nuts holding speaker. Remove speaker.

PROJECTION TUBE UNIT

1. Remove 4 nuts and bolts holding projection tube unit. Remove unit.

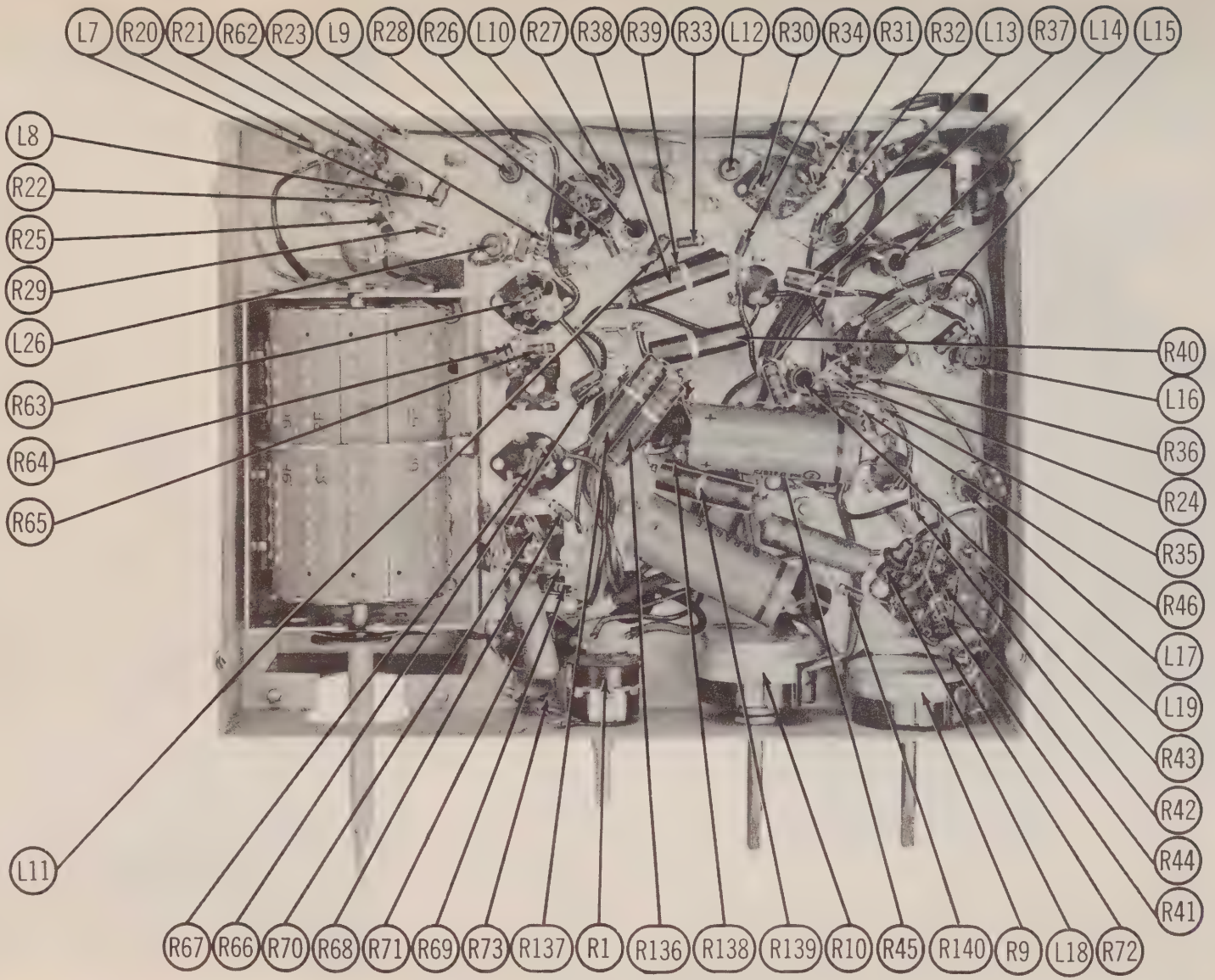
POWER SUPPLY UNIT

1. Remove 4 nuts and bolts holding power supply unit. Remove unit.

RESISTANCE MEASUREMENTS

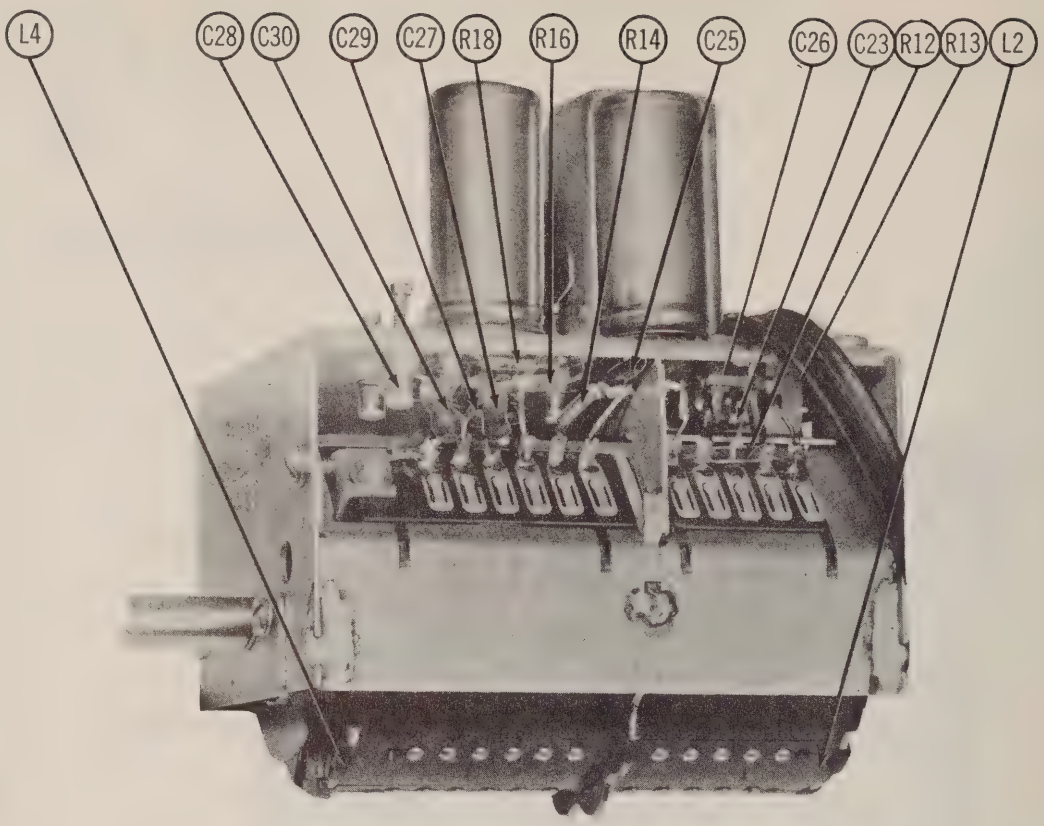
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2Meg	0Ω	.1Ω	0Ω	¶5KΩ	¶5KΩ	0Ω		
V 2	6J6	¶7.5KΩ	¶18KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	2Meg	47Ω	.1Ω	0Ω	¶1.6KΩ	¶1.6KΩ	0Ω		
V 4	6CB6	2Meg	47Ω	.1Ω	0Ω	¶1.5KΩ	¶1.5KΩ	0Ω		
V 5	6CB6	10KΩ	47Ω	.1Ω	0Ω	¶1.4KΩ	¶1.4KΩ	0Ω		
V 6	6AL5	4.7KΩ	1Meg	0Ω	.1Ω	200Ω	0Ω	.2Ω		
V 7	6SN7GT	1Meg	¶2.3KΩ	400Ω	4.7KΩ	¶2.4KΩ	1.4KΩ	.1Ω	0Ω	
V 8	6V6GT	INF	.1Ω	¶1.3KΩ	¶1.3KΩ	470KΩ	INF	0Ω	130Ω	
V 9	6CB6	47Ω	150Ω	.1Ω	0Ω	■3.3KΩ	■47KΩ	0Ω		
V 10	6V6GT	INF	■.1Ω	†4.3KΩ	†22KΩ	620KΩ	INF	■0Ω	9KΩ	
V 11	6BA6	470KΩ	0Ω	0Ω	.1Ω	¶12KΩ	¶15KΩ	47Ω		
V 12	6AU6	10KΩ	0Ω	.1Ω	0Ω	16KΩ	16KΩ	0Ω		
V 13	6AT6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	¶470KΩ		
V 14	6AT6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	■470KΩ		
V 15	6V6GT	INF	0Ω	†1.5KΩ	†1.1KΩ	470KΩ	INF	.1Ω	330Ω	
V 16	6SN7GT	1Meg	■4.7KΩ	4.7KΩ	0Ω	■82KΩ	270KΩ	.1Ω	0Ω	
V 17	6SN7GT	950KΩ	†1.9Meg	0Ω	1Meg	9KΩ	0Ω	0Ω	.1Ω	
V 18	6SN7GT	2.2Meg	†2KΩ	2.1KΩ	1Meg	1Meg	0Ω	0Ω	.1Ω	
V 19	6AL5	33KΩ	33KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 20	6SN7GT	80KΩ	■140KΩ	820Ω	5.1Meg	■18KΩ	820Ω	.1Ω	0Ω	
V 21	6BQ6GT	INF	.1Ω	4.7KΩ	†19KΩ	560KΩ	INF	0Ω	330Ω	Top Cap #180Ω
V 22	6W4GT	INF	INF	†11KΩ	INF	†65Ω	INF	.1Ω	0Ω	
V 23	6SN7GT	0Ω	110KΩ	4.5KΩ	1.9Meg	■18KΩ	0Ω	.1Ω	0Ω	
V 24	6L6	0Ω	0Ω	†960Ω	†33KΩ	47KΩ	†960Ω	.1Ω	220Ω	
V 25	6V6GT	0Ω	0Ω	3.2Ω	3.2Ω	300KΩ	INF	.1Ω	820Ω	
V 26	1B3GT	PINS 1-8 HAVE INF RESISTANCE								Top Cap 300KΩ
V 27	1B3GT	PINS 1-8 HAVE INF RESISTANCE								Top Cap INF
V 28	5U4G	INF	30KΩ	INF	220Ω	INF	220Ω	INF	30KΩ	
V 29	5V4G	INF	16KΩ	¶165Ω	50Ω	INF	54Ω	INF	16KΩ	
V 30	3NP4	0Ω	.1Ω	0Ω	0Ω	180KΩ				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V28.
¶ MEASURED FROM PIN 8 OF V29
# MEASURED FROM PIN 3 OF V22
■ MEASURED FROM 135 VDC LINE

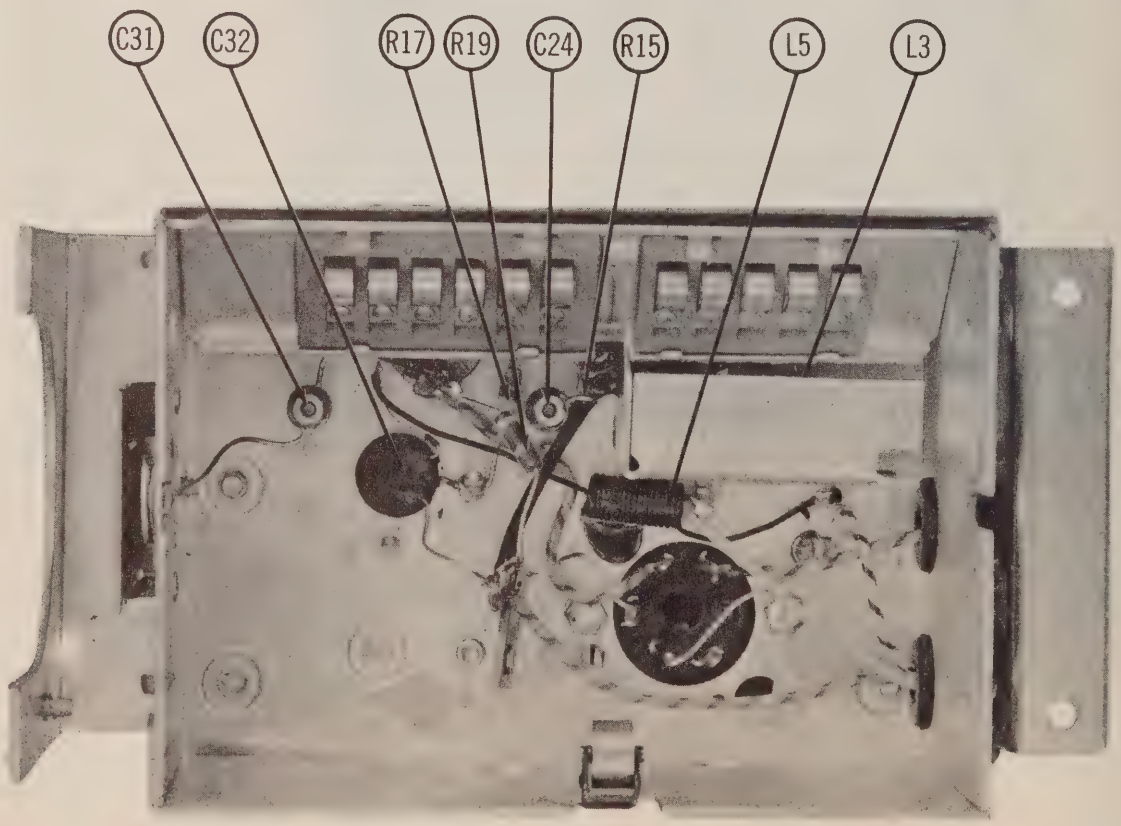


TUNER-IF CHASSIS-BOTTOM VIEW

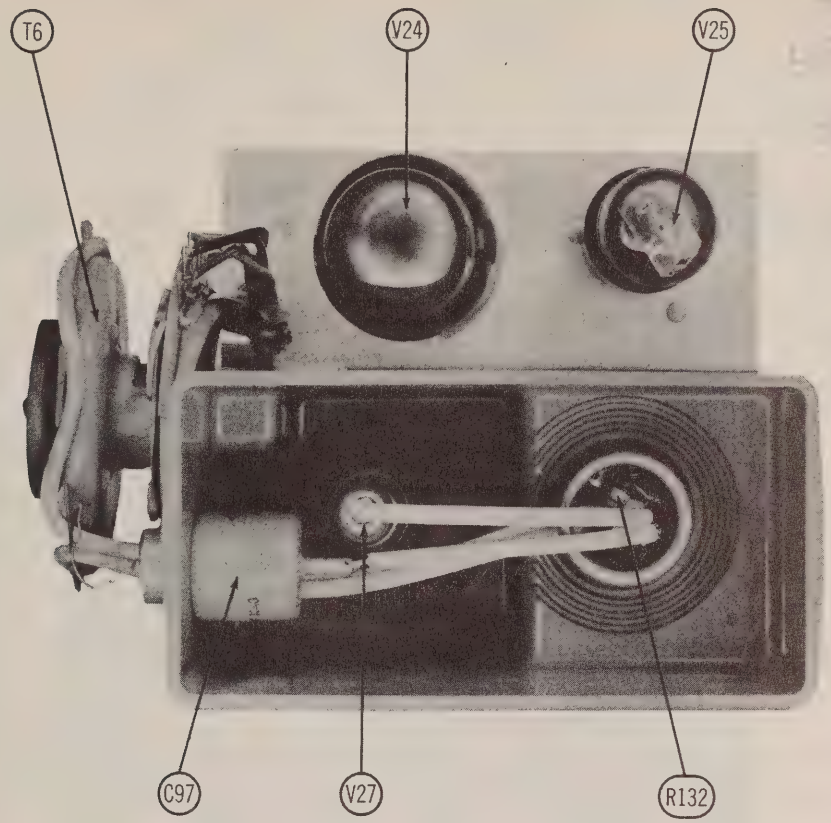
PROPERTY OF
L. F. BLANKENSHIP
3924 LEANDER ST.
DENVER, COLORADO



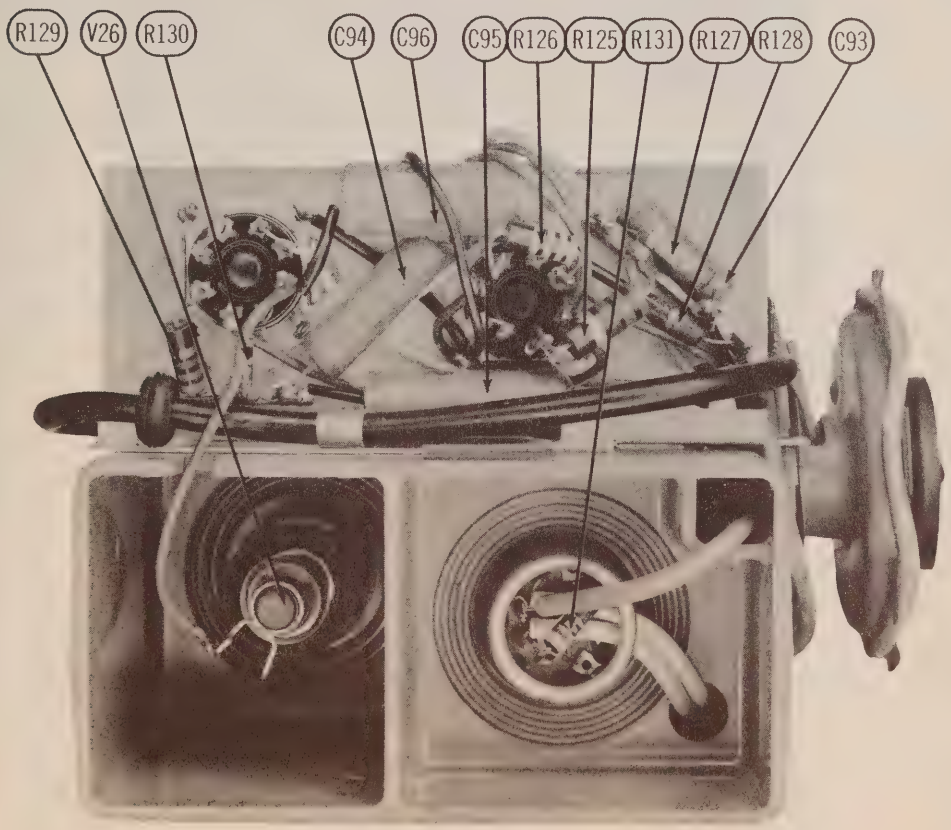
RF TUNER-RIGHT SIDE



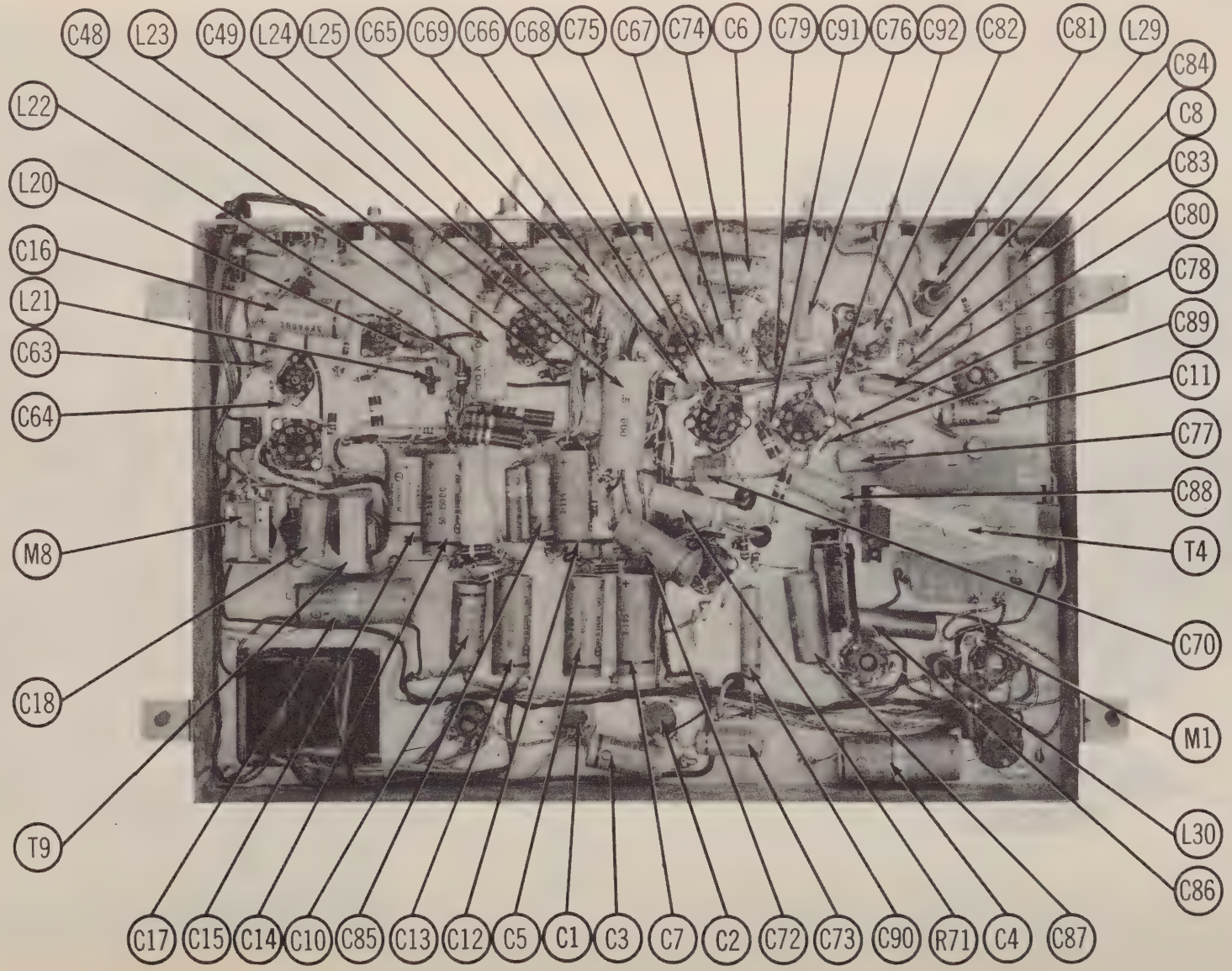
RF TUNER-BOTTOM VIEW



HIGH VOLTAGE SUPPLY - TOP VIEW



HIGH VOLTAGE SUPPLY - BOTTOM VIEW



SWEEP CHASSIS - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: NORELCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6AG5	6AG5	7BD	
B	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector AGC Rectifier	6AL5	6AL5	6BT	
V7	1st. Video Amp. Audio Cathode Follower	6SN7GT	6SN7GT	8BD	
V8	Video Cathode Follower	6V6GT	6V6GT	7AC	
V9	2nd. Video Amp.	6CB6	6CB6	7CM	
V10	Video Output	6V6GT	6V6GT	7AC	
V11	Sound IF Amp.	6BA6	6BA6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	1st. AF Amplifier	6AT6	6AT6	7BT	
V14	2nd. AF Amplifier	6AT6	6AT6	7BT	
V15	Audio Output	6V6GT	6V6GT	7AU	
V16	Sync. Sep. - 1st Sync. Amplifier	6SN7GT	6SN7GT	8BD	
V17	2nd. Sync. Amp. Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V18	Vert. Output, Vert Sweep Failure Protection	6SN7GT	6SN7GT	8BD	
V19	Horiz. Phase Det.	6AL5	6AL5	6BT	
V20	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V21	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V22	Damper	6W4GT	6W4GT	4CG	
V23	Horiz. Sweep Failure Protection Vert. Sweep Failure Protection	6SN7GT	6SN7GT	8BD	
V24	HV Oscillator	6L6	6L6	7AC	
V25	HV Regulator	6V6GT	6V6GT	7AC	
V26	HV Rectifier	1B3GT	1B3GT	3C	
V27	HV Rectifier	1B3GT	1B3GT	3C	
V28	LV Rectifier	5U4G	5U4G	5T	
V29	LV Rectifier	5V4G	5V4G	5L	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: NORELCO PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA:	RTMA BASE TYPE	NOTES
V30	3NP4			5BV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: NORELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	40	500	3-137	AFH1-61		UP4050			Filter
C2	80	450	3-132	AFH1-55		UP8045		TVL-1850	Filter
C3	100	50	3-69	PRS50/100		BRH501		TVA-1310	Bias Filter
C4	40	450	3-134	PRS450/40		BR4045A		TVA-1712	HV Osc. Decoupling
C5	20	450	3-135	PRS450/20		BR2045A		TVA-1709	Vert. Output Dec.
C6	100	50	3-69	PRS50/100		BRH501		TVA-1310	Vert. Output Cathode
C7	20	450	3-135	PRS450/20		BR2045A		TVA-1709	Vert. Osc. Dec.
C8	40	450	3-134	PRS450/40		BR4045A		TVA-1712	Decoupling
C9	40	450	3-134	PRS450/40		BR4045A		TVA-1712	Decoupling *
C10	100	50	3-69	PRS50/100		BRH501		TVA-1310	Horiz. Cent. Bypass
C11	10	25	3-103	PRS25/10		BR102A		TVA-1204	Horiz. Output Cathode
C12	20	450	3-135	PRS450/20		BR2045A		TVA-1709	Video Output Dec.
V13	20	450	3-135	PRS450/20		BR2045A		TVA-1709	Video Output Screen
C14	50	250	3-110	PRS250/40		BR5025		TVA-1511	Video Output Cathode
C15	1000	6	3-30	PRS6/1000		BRH610		TVA-1104	Video Coupling
C16	40	450	3-134	PRS450/40		BR4045A		TVA-1712	Audio Output Dec.
C17	25	25	3-133	PRS25/25		BR252A		TVA-1205	Audio Output Cathode
C18	20	250	3-113	PRS250/20		BR2025		TVA-1508	Video Amp. Screen
C19	50	250	3-110	PRS250/40		BR5025		TVA-1511	Filter
C20	50	250	3-110	PRS250/40		BR5025		TVA-1511	Filter *
C21A	80	150	3-175	AFH3-11		UP75D15			▲ Decoupling
B	80	150							■ Decoupling
C22A	80	150	3-175			UP75D15			■ Decoupling
B	80	150							▲ Decoupling
C23	3-9				829-10				Variable Trimmer
C24	.5-3				829-3				Variable Trimmer
C25	120			SII20	D6-121	TM5T12	GP2K-121	5GA-T12	RF Amp. Decoupling
C26	1000			SII000	D6-102	TM5D1	GP2L-102	5HK-D1	RF Amp. Fil.
C27	100			SII00	D6-101	TM5T1	GP1K-101	5GA-T1	RF Coupling
C28	.5-3				829-3				Variable Trimmer
C29	20			SI20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C30	10			SII0N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C31	.5-3				829-3				Variable Trimmer
C32A	1000		3-144	BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	Conv. Fil.
B	10000								RF Bypass
C33	10000		3-83	BPD-01	DD-103	TM5S1	821-01	5HK-S1	RF Bypass
C34A	4000		3-139	BPD-2X004	D6-402	TM5DD4	822-004	5HK-2D4	AGC Filter
B	4000				D6-402				1st. Video IF Dec.
C35	1000		3-143	BPD-001	DD-102	TM5D1	801-001	5HK-D1	IF Coupling
C36	.05	400		P488-05	DF-503	PTE6S5		4TM-S5	AGC Filter
C37A	4000		3-139	BPD-2X004	D6-402	TM5DD4	822-004	5HK-2D4	AGC Filter
B	4000				D6-402				2nd Video IF Dec.
C38	1000			BPD-001	DD-102	TM5D1	801-001	5HK-D1	IF Coupling
C39A	4000		3-139	BPD-2X904	D6-402	TM5DD4	822-004	5HK-2D4	3rd Video IF Dec.
B	4000				D6-402				3rd Video IF Cathode

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA NORELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES INSTALLATION NOTES
C40	1000		3-143	BPD-001	DD-102	TM5DN	801-001	5HK-DI	IF Coupling
C41	‖			S1SNP0	TCZ-4.7		NP0K-050		IF Coupling †
C42	47	500	3-2	1469-00005		5R5Q5		MS-45	Fixed Trimmer
C43	130	500		1469-00015		5R5T15			IF Coupling
C44	47	500	3-2	1469-00005		5R5Q5		MS-45	Fixed Trimmer
C45	470	500		1469-0005		5R5T5		MS-35	1st Video Amp. Cathode
C46	.1	200		P288-1	DF-104	P2P1		2TM-P1	Video Coupling AND
C47	‖			‖	TCZ-4.7		NP0K-050		Fixed Trimmer
C48	.5	200		P288-5		P2P5		2TM-P5	Video Coupling
C49	.5	600		684-5		P26P5		6TM-P5	Video Coupling
C50	5000		3-48	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Rect. Cathode
C51	‖			S1SNP0	TCZ-4.7		NP0K-050		Sound IF Coupling
C52	47	500	3-2	1469-00005		5R5Q5		MS-050	Fixed Trimmer
C53	1000		3-143	BPD-001	DD-102	TM5DI	801-001	5HK-DI	Sound IF Grid
C54A	1000		3-144	BPD-2X001	DD-2-102	TM5DDI	812-001	5HK-2DI	Sound IF Screen
B	1000								Sound IF Cathode
C55	10000		3-83	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Sound IF Plate
C56	47	500	3-2	1468-00005	D6-470	5W5Q5	GP1K-470	1FM-45	Limiter Grid Filter
C57	10000		3-83	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Limiter Decoupling
C58	2.2				TCZ-2.2		NP0K-2R2		Fixed Trimmer *
C59	1000		3-143	BPD-001	DD-102	TM5DI	801-001	5HK-DI	De-emphasis
C60	.05	200		P288-05	DF-503	P2B5		2TM-S5	Audio Coupling
C61	10000		3-83	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Audio Coupling
C62	10000		3-83	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Audio Coupling
C63	10000		3-83	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Audio Coupling
C64	10000		3-83	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Audio Coupling
C65	.05	600		P688-05	DF-503	PTE5B5		6TM-S5	Sync. Coupling
C66	10000		3-85	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Sync. Coupling
C67A	.002			P686-002		PTE6D2	GP2-333-302		Vert. Integrator Net.
B	.025			P686-005	xPC-100	PTE6D5	GP2-333-502	x101C1	Vert. Integrator Net.
C	.005			P686-005		PTE5D5	GP2-333-502		Vert. Integrator Net.
C68	10000		3-85	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Vert. Sync. Coupling
C69	10000		3-85	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Voltage Divider
C70 ◊	10000	500						MS-11	Vert. Osc. Grid Cap.
C71	.1	500		P688-1	DF-104	PTE6P1		6TM-P1	Vert. Discharge
C72	.25	600		684-25		PTE6P25		6TM-P25	Vert. Sweep Coupling
C73	.05	600		P688-05	DF-503	PTE6B5		6TM-S5	Fixed Trimmer
C74	1000			S1D00	D6-102	TM5DI	GP2L-102	5HK-DI	Horiz. Sync. Coupling
C75	1000			S1D00	D6-102	TM5DI	GP2L-102	5HK-DI	Horiz. Sync. Coupling
C76	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Voltage Divider
C77	.05	600		P688-05	DF-503	PTE6B5		6TM-S5	Horiz. Feedback
C78	1000			S1D00	D6-102	TM5DI	GP2L-102	5HK-DI	Voltage Divider
C79	5000		3-48	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. AFC Coupling
C80	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Horiz. MV Grid
C81	4700	500		1464-005		1DR5D5		MS-25	Fixed Trimmer
C82	330	500		1469-00035					Horiz. MV Feedback
C83	500			P688-05	D6-681		GP2K-681	5GA-T68	Horiz. Discharge †
C84	10000		3-85	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Horiz. Sweep Coupling
C85	.05	600		P688-05	DF-503	PTE6B5		6TM-S5	Horiz. Output Screen
C86	.05	1000		P1088-05				MB-S5	Damper Filter
C87	.25	600		684-25		PTE6P25		6TM-P25	Damper Filter
C88	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sweep Coupling
C89	10000		3-85	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Voltage Divider
C90	.25	300		P488-25		P2P25		2TM-P25	Vert. Sweep Coupling
C91	5000		3-85	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Bias Filter
C92	10000		3-85	BPD-01	DD-103	TM5BI	821-01	5HK-SI	Bias Filter
C93	.01	400	G8.381.01	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	HV Osc. Grid Cap.
C94	.01	600	G8.381.23	P688-01	D6-103	PTE4SI	GP2-333-103	6TM-SI	HV Osc. Screen Bypass
C95	.1	400	G8.381.09	P488-1	DF-104	PTE4P1		4TM-P1	HV Osc. Cathode
C96	.1	400	G8.381.09	P488-1	DF-104	PTE4P1		4TM-P1	HV Regulator Grid
C97	500	20000	P8.000.18 †	HV20A	TV1-502	MM-A20TS	410-501		HV Filter

* Not Used in all Models
† When ordering this part, also order Push-on Nut Part No. G5.399.97
◊ Items C67A, C67B, C67C, R87A, R87B, R87C are combined in one unit.
◊ Some Models use 2.2MMF in this application
¶ Some Models use 820MMF in this application

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA NORELCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	1-46	Q13-133X	AT-78	B-60-S	Volume Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A per instructions
R2A	100KΩ	½	1-54	Q11-128	AG-48-S	AN-40	Brightness Control
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Attach to R2A per instructions
R3A	1Meg	½	1-48	Q11-137	AG-61-S	AN-89	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Attach to R3A per instructions
R4A	2.5Meg	½	1-44	Q11-239	AG-84-S	AN-83	Vert. Size Control
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Attach to R4A per instructions
R5	5KΩ	2	1-39	W-5000	43-5000	VK-135	Vert. Linearity Control - Wire Wound
R6A	50KΩ	½	1-49	Q11-123	AG-44-S	AN-31	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Attach to R5A per instructions
R7A	100KΩ	½	1-54	Q11-128	AG-48-S	AN-40	Horiz. Drive Control
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Attach to R6A per instructions
R8	100Ω	2	1-69	W-100	43-100	VK-121	Horiz. Centering Control - Wire Wound
R9	750Ω	2	1-68	W-750	43-750	V-128	Contrast Control - Wire Wound
R10	500Ω	4	1-65		RTV-302	SVP985	Focus Control - Wire Wound
R11	500Ω	4	1-77				Focus Control - Wire Wound See Note

Note. Some Models use Alternate Focus Control (Part #1-80)

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA NORELCO PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R12	3900Ω	½		BTS-3900	Antenna Coil Shunt
R13	47KΩ	½		BTS-47K	AGC Network
R14	10KΩ	½		BTS-10K	RF Coil Shunt
R15	2200Ω 20%	½		BTS-2200	RF Amp. Decoupling
R16	4700Ω	½		BTS-4700	Mixer Grid
R17	220KΩ 20%	½		BTS-220K	Mixer Grid
R18	10KΩ	½			Osc. Grid
R19	4700Ω	½		BTS-4700	Osc. Plate
R20	8200Ω 5%	½			1st Video IF Amp. Grid
R21	47Ω	½			1st Vider IF Amp. Cathode
R22	10KΩ 5%	½			2nd Video IF Coil Shunt
R23	330Ω	½		BTS-330	AGC Network
R24	1Meg	½		BTS-1Meg	AGC Network
R25	120Ω	1		BTA-1200	Decoupling
R26	8200Ω 5%	½			2nd Video IF Amp. Grid
R27	47Ω	½			2nd Video IF Amp. Cathode
R28	10KΩ 5%	½			3rd Video IF Coil Shunt
R29	120Ω	½		BTS-120	Decoupling
R30	10KΩ 5%	½			3rd Video IF Amp. Grid
R31	47Ω	½			3rd Video IF Amp. Cathode
R32	8200Ω 5%	½			4th Video IF Coil Shunt
R33	120Ω	½		BTS-120	Decoupling
R34	120Ω	½		BTS-120	Decoupling
R35	47000Ω	½		BTS-4700	Video Det. Diode Load
R36	1Meg	½		BTS-1Meg	AGC Rectifier Diode Load
R37	22KΩ	2		BTB-22K	Voltage Dropping
R38	2200Ω	2		BTB-2200	Decoupling
R39	2200Ω	2		BTB-2200	Decoupling
R40	2200Ω	2		BTB-2200	Filter
R41	820Ω	½		BTS-820	1st Video Amp. Cathode - See note 1.
R42	1200Ω	½		BTS-1200	1st Video Amp. Plate
R43	1Meg	½		BTS-1Meg	AF Cathode Follower Grid
R44	150Ω	½		BTS-150	AF Cathode Follower Cathode
R45	470KΩ	½		BTS-470K	Video Cathode Follower Grid
R46	330Ω	½		BTS-330	Video Cathode Follower Cathode
R47	220Ω	½		BTS-220	Video Peaking - See note 2.
R48	47Ω	½			Parasitic Suppressor
R49	150Ω	½		BTS-150	2nd Video Amp. Cathode
R50	47KΩ	½		BTS-47K	2nd Video Amp. Screen
R51	10KΩ	½		BTS-10K	Video Peaking Coil Shunt
R52	3300Ω	½		BTS-3300	2nd Video Amp. Plate
R53	22KΩ	2		BTB-22K	Video Output Cathode
R54	22KΩ	2		BTB-22K	Video Output Cathode
R55	470KΩ	½		BTS-470K	Video Output Grid
R56	3900Ω	1		BTA-3900	Video Output Plate
R57	270KΩ 5%	½		BTA-270K 5%	Voltage Divider
R58	150KΩ	½		BTS-150K	Voltage Divider
R59	330Ω	2		BTB-330	Decoupling
R60	22KΩ	1		BTA-22K	Video Output Screen
R61	10KΩ	½		BTS-10K	Peaking Coil Shunt
R62	470KΩ	½			Sound IF Amp. Grid
R63	47Ω	½			Sound IF Amp. Cathode
R64	2700Ω	½		BTS-2700	Sound IF Amp. Screen
R65	10KΩ 5%	½			Sound IF Amp. Decoupling
R66	10KΩ 5%	½			Limiter Grid
R67	22KΩ	½			Limiter Screen
R68	33KΩ	½			Limiter Decoupling
R69	100KΩ	½		BTS-100K	Discriminator Diode Load
R70	100KΩ	½		BTS-100K	Discriminator Diode Load
R71	18KΩ	½			De-emphasis
R72	470KΩ	½		BTS-470K	1st AF Amp. Plate
R73	10Meg	½		BTS-10Meg	1st AF Amp. Grid
R74	470Ω	½		BTS-470	AF Cathode Follower Cathode
R75	10Meg	½		BTS-10Meg	2nd AF Amp. Grid
R76	470KΩ	½		BTS-470 K	2nd AF Amp. Plate
R77	470KΩ	½		BTS-470K	Output Grid
R78	330Ω	1		BTA-330	Output Cathode
R79	2200Ω	2		BTB-2200	Output Decoupling
R80	2000Ω	2		BTB-2200	Output Decoupling
R81	2.7KΩ	½		BTS-2700	Isolation
R82	270KΩ	½		BTS-270K	Sync. Separator Cathode
R83	82KΩ	½		BTS-82K	Sync. Separator Plate
R84	1Meg	½		BTS-1Meg	1st Sync. Amp. Grid
R85	4700Ω	½		BTS-4700	1st Sync. Amp. Cathode
R86	4700Ω	½		BTS-4700	1st Sync. Amp. Plate
R87A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½	◊30-147	BTS-8200	Integrator Network
C	8200Ω	½		BTS-8200	Integrator Network
R88	1Meg	½		BTS-1Meg	2nd Sync. Amp. Grid
R89	47KΩ	½		BTS-47K	2nd Sync. Amp. Plate
R90	10KΩ	½		BTS-10K	2nd. Sync. Amp. Plate
R91	560KΩ	½		BTS-560K	Vert. Osc. Grid
R92	1Meg	½		BTS-1Meg	Vert. Osc. Plate
R93	47KΩ	½		BTS-47K	Vert. Osc. Plate Decoupling
R94	3900Ω	½		BTS-3900	Vert. Peaking
R95	2.2Meg	½		BTS-2.2Meg	Vert. Output Grid
R96	560Ω	½		BTS-560	Vert. Output Cathode
R97	1KΩ	1		BTA-1K	Vert. Output Plate Decoupling
R98	1Meg	½		BTS-1Meg	Sweep Failure Protection Plate
R99	470KΩ	½		BTS-470K	Integrator Network
R100	470KΩ	½		BTS-470K	Integrator Network
R101	100KΩ	½		BTS-100K	Horiz. Phase Det. Diode Load
R102	100KΩ	½		BTS-100K	Horiz. Phase Det. Diode Load
R103	4.7Meg	½		BTS-4.7Meg	Horiz. Phase Det. Diode Load
R104	470KΩ	½		BTS-470K	Horiz. AFC Filter
R105	33KΩ	½		BTS-33K	Feedback Network
R106	4700Ω	½		BTS-4700	Feedback Network
R107	1500Ω	½		BTS-1500	Feedback Network
R108	820Ω	½		BTS-820	Horiz. MV Cathode
R109	18KΩ	½		BTS-18K	Horiz. MV Plate
R110	68KΩ	½		BTS-68K	Horiz. MV Grid
R111	82KΩ	½		BTS-82K	Horiz. MV Plate
R112	560KΩ	½		BTS-560K	Horiz. Output Grid
R113	47Ω	½			Parasitic Suppressor
R114	330Ω	2		BTB-330	Horiz. Output Cathode
R115	56KΩ	2		BTB-56K	Horiz. Output Screen

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA NORELCO PART No.	IRC PART No.	IDENTIFICATION CODES
R116	56KΩ	2		BTB-56K	Horiz. Output Screen
R117	56KΩ	2		BTB-56K	Horiz. Output Screen
R118	1200Ω	1		BTA- 1200	Damper Filter
R119	10KΩ	20	2-158	2D-10K	Damper Filter - Wire Wound
R120	39KΩ	½		BTS-39K	Voltage Divider - See Note 3
R121	100KΩ	2		BTB-100K	Voltage Divider
R122	100KΩ	2		BTB-100K	Voltage Divider
R123	8200Ω	2		BTB-8200	Voltage Divider
R124	10KΩ	2		BTB-10K	Voltage Divider
R125	220Ω	2	G8.348.17		HV Osc. Cathode
R126	33KΩ	1	G8.317.43	BTA-33K	HV Osc. Screen
R127	47KΩ	½	G8.312.45	BTS-47K	HV Osc. Grid
R128	560Ω	½	G8.305.22		Parasitic Suppressor
R129	820Ω 5%	½	G8.315.46	BTS-820 5%	HV Regulator Cathode
R130	300KΩ 5%	½	G8.311.12		HV Regulator Grid
R131	3.3Ω	½	G8.324.03		HV Rectifier Filament - Wire Wound
R132	3.3Ω	½	G8.324.03		HV Rectifier Filament - Wire Wound
R133	1.5Meg	½			HV Filter
R134	18Ω	2			Voltage Divider
R135	1800Ω	2			Voltage Divider
R136	330Ω	2		BTB-330	Filter
R137	330Ω	2		BTB-330	Filter
R138	2200Ω	2		BTB-2200	Filter
R139	2200Ω	2		BTB-2200	Filter
R140	1Meg	½		BTS-1Meg	Video Amp. Grid
R141	4700Ω	½		BTS-4700	Horiz. Peaking
R142	120KΩ	½		BTS-120K	Sync. Separator Plate
R143	39Ω	½			Parasitic Suppressor
R144	100KΩ	½		BTS-100K	Picture Tube Cathode - See note 4.

◊ Items R87A, R87B, R87C, C67A, C67B, C67C are combined in one unit.
Note 1. Some models use a 120Ω resistor in this application.
Note 2. Some models use a 180Ω resistor in this application.
Note 3. Some models use a 47KΩ resistor in this application.
Note 4. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA NORELCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @2.0A	800VCT @.225ADC	5VAC @3.0A	6.3VAC @6.0A	20B-515	P-8169	P-3067	TP-380
				SEC. 4 6.3VAC @1.1A				
T2	117VAC @1.8A	420VCT @.137ADC	5VAC @2.0A	6.3VAC @4.6A	20B-627		P-3173 ①	

① Drill New Mounting Holes and add Series Resistor to reduce high voltage.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA NORELCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T3	200Ω	1100Ω	20B-564	A-8111 ①	A-3000 ①	TB0-1 ②	Vert. Oscillator Trans.
T4	100Ω	9Ω Tapped @.5Ω	20-38				Hor. Output Trans.
T5	1000Ω	9.5Ω	20B-563	A-8112 ①	A-3036	TS0-5 ①	Vert. Output Trans.
T6	1150Ω	3.5Ω	P9.001.81				HV Oscillator Trans.
	Tapped @2Ω	SEC. 2 2.9Ω					
		SEC. 3 0Ω					
		SEC. 4 0Ω					
T7A	17Ω		P9.000.22				Hor. Deflection Coils
B	86Ω						Vert. Deflection Coils
T8	290Ω		P9.205.12M				Focus Coil

① Drill One New Mounting Hole
② Drill New Mounting Holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA NORELCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T9	3.7KΩ	3.8Ω	360Ω	.5Ω	20-21	A-3825 ①	A-3018 ①	R0-302	① Drill One New Mounting Hole

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA NORELCO PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	PM	3.6Ω	38-8	12J12	12A4A	
	CONE DIA.	V. C. DIA.				
SP1B	12"	1"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (D CURRENT 1000 m)	REPLACEMENT DATA NORELCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.225ADC	60Ω	2 Henries	21B-539	C-2326 ①	C-2991 ①	TR-3300 ①	① Drill One New Mounting Hole.

NORELCO MODEL 588A

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	NORELCO PART No.	MERIT PART No.	
L2	Ant. Coils	0Ω	0Ω			
L3	Fil. Choke	0Ω				
L4	RF Mixer Grid & Osc. Coils	0Ω				
L5	Fil. Choke	0Ω				
L6	Conv. Plate	1Ω				
L7	1st Video IF Plate	.2Ω			TV-112	
L8	RF Choke	.1Ω		21A-518-1		
L9	2nd Video IF Grid	.1Ω		21A-517-2	TV-112	
L10	2nd Video IF Plate	.2Ω			TV-112	
L11	RF Choke	.1Ω		21A-518-1		
L12	3rd Video IF Grid	.1Ω		21A-517-2	TV-112	
L13	3rd Video IF Plate	.2Ω			TV-112 *	* Parallel with 8.2KΩ Resistor
L14	Video Det. Plate	1Ω		21A-517-4	TV-112	
L15	Video Det. Coil	.1Ω		21A-517-2	TV-112	
L16	IF Trap	0Ω		21A-517-1	TV-150	
L17	4.5MC Trap	1.8Ω		21A-517-5	TV-151	
L18	Peaking Coil	4Ω		21A-620-6	TV-181	93Microhenries
L19	77.25MC Trap	0Ω		21A-517-1		
L20	Peaking Coil	4.2Ω		21A-260-7	TV-181	100Microhenries
L21	Peaking Coil	7.4Ω		21A-260-8	TV-185	270Microhenries
L22	Peaking Coil	4Ω		21A-260-6	TV-181	93Microhenries
L23	Peaking Coil	4Ω		21A-260-6	TV-181	93Microhenries
L24	Peaking Coil	4.2Ω		21A-260-7	TV-181	100Microhenries
L25	Peaking Coil	4Ω		21A-260-6	TV-181	93Microhenries
L26	1st Sound IF	0Ω		21A-517-1		
L27	2nd Sound IF	.1Ω	.1Ω	20-9	TV-104	
L28	Discr. Trans.	.1Ω	.2Ω	20-1	TV-106	Tap ⓐ .1Ω
L29	Horiz. Osc.	100Ω		21-28	TV-163	
L30	Horiz. Lin.	35Ω		21-6	MWC-1	

FUSES

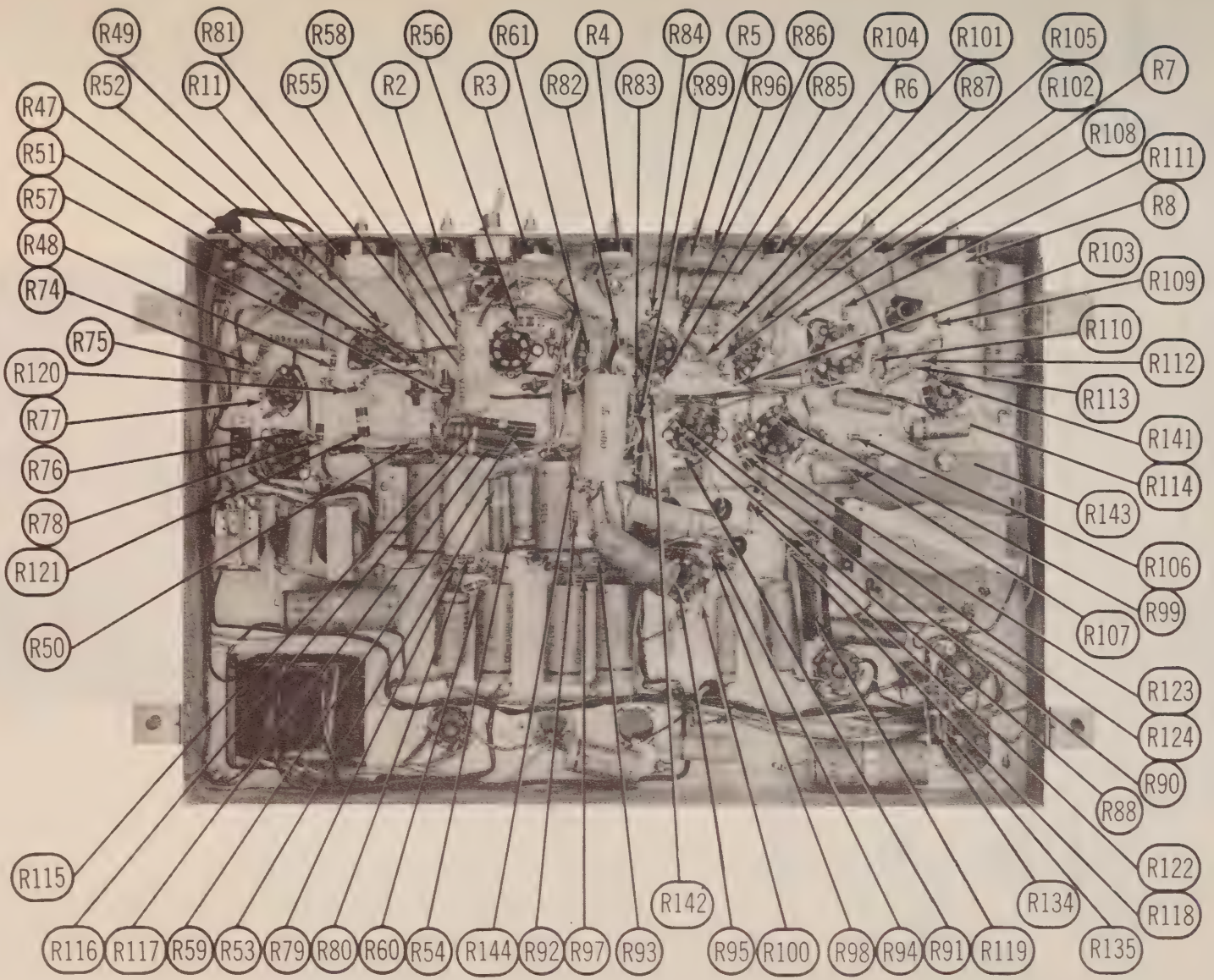
ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			NORELCO PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	1/4A 250V.	11-9		318.250		
M2	3AG Slo-Blo	2½A. 126V	11-10		31302.5	342001	
M3	3AG Slo-Blo	2½A 125V.	11-10		31302.5	342001	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					NORELCO PART No.		
M4	Bayonet	6-8	.15	Brown			Type #47

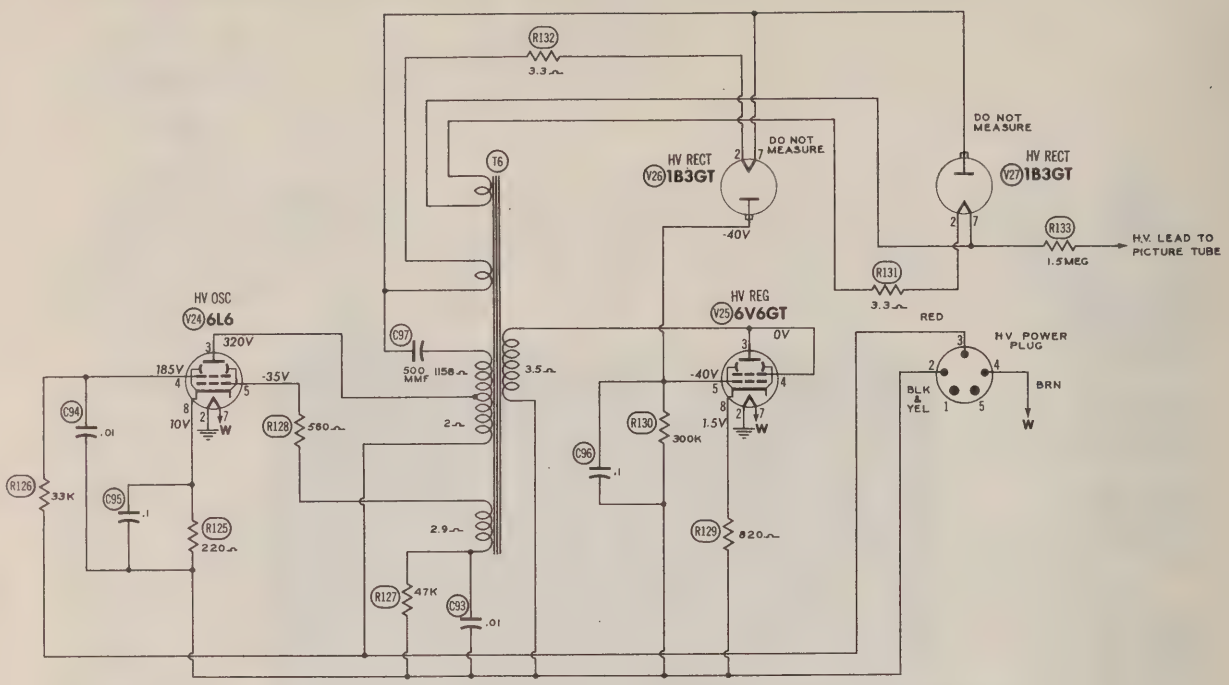
MISCELLANEOUS

ITEM No.	PART NAME	NORELCO PART No.	NOTES
M5	RF Tuner	39-9	Complete with Tubes
M6	Crystal		(1N34)
M7	Crystal		(1N34)
M8	Relay	5-2	12Amp.
M9	Switch		

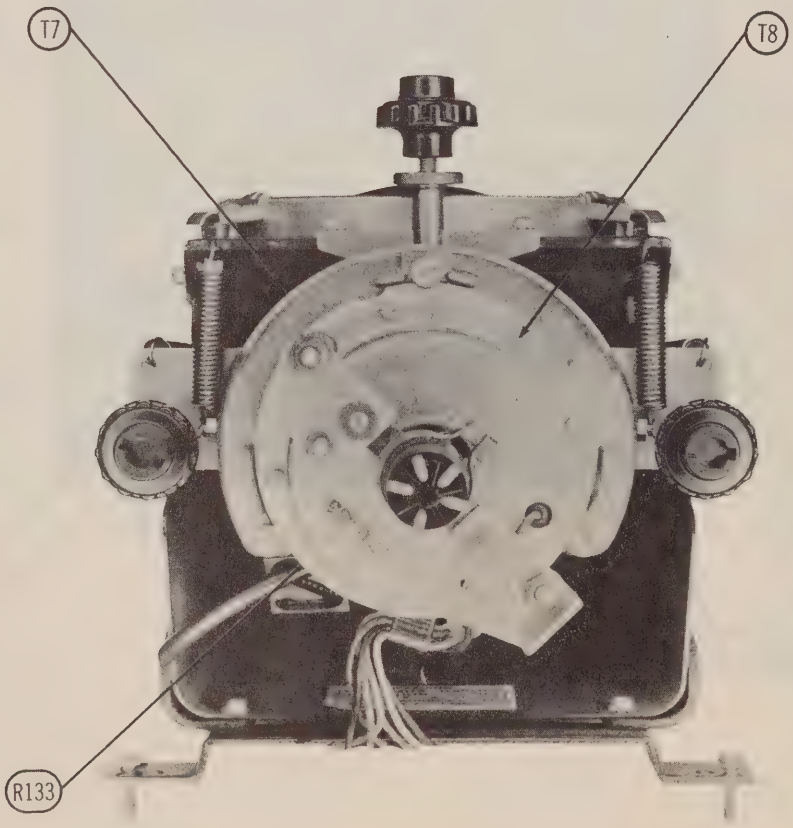


SWEEP CHASSIS-BOTTOM VIEW

PROPERTY OF
C. F. CLAY
3494 W.
DETROIT



HIGH VOLTAGE SUPPLY



OPTICAL UNIT—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

PROPERTY OF
L. F. BLANKENSHIP
3924 WADE ST.
DENVER, COLORADO

The following adjustments should be made by looking at the face of the tube, since misadjustment of the optical system may cause erroneous indications on the viewing screen.

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), to the center of the range over which the picture synchronizes horizontally.

Adjust the horizontal drive control clockwise as far as possible without crowding or bright vertical lines appearing in the picture.

Adjust the horizontal linearity slug, (B2) until the picture is symmetrical from left to right.

Since width and horizontal linearity are both effected by the setting of the drive control, it may be necessary to adjust the drive and linearity slug alternately for optimum linearity and proper width.

RADIO CRAFTSMEN MODEL 500

PROPERTY OF
L. F. BLAIR
3924 MEADE
DENVER, COLO.

RADIO CRAFTSMEN
MODEL 500

RADIO CRAFTSMEN
MODEL 500

TRADE NAME	Radio Craftsmen Model 500
MANUFACTURER	The Radio Craftsmen, Inc., 4401 N. Ravenswood Ave., Chicago, 40, Ill.
TYPE SET	AC Operated Audio Amplifier
TUBES (FIVE)	Types 6SN7GTA 1st. AF Amp.-Phase Inv., 6SN7GTA Driver, (2) KT66 Audio Output, 5V4G Rectifier
POWER SUPPLY	110-120 Volts AC RATING 1.25 Amp. @ 117 Volts AC

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		CRAFTSMEN PART No.	STANDARD REPLACEMENT		
V1	1st. AF Amplifier	6SN7GTA	6SN7GTA	8BD	
V2	Driver	6SN7GTA	6SN7GTA	8BD	
V3	Audio Output	KT66	KT66	7AC	
V4	Audio Output	KT66	KT66	7AC	
V5	Rectifier	5V4G	5V4G	5L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Radio Craft. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	4	600	18X310	GL600/4		KR604		AP-46	Filter
C2A	40	500	18S033	AFH2-72		UP4450		TVL-2830	▲ Filter
B	40	500		PRS450/8-8		BRD8D45		TVA-2720	■ Decoupling
C	8	400							▲ Decoupling
D	8	400							Decoupling
C3	560	500	CM20A561J						1st. AF Amp. Plate
C4	.47	400	CP10M4474M	484-5		PJ4P5		4TM-P5	Audio Coupling
C5	.47	400	CP10M4474M	484-5		PJ4P5		4TM-P5	Audio Coupling
C6	.1	400	CP10M4104M	P488-1		PTE4P1		4TM-S1	Audio Coupling
C7	.1	400	CP10M4104M	P488-1		PTE4P1		4TM-S1	Audio Coupling
C8	.22	400	CP10M2224M	P488-22		PTE4P22		4TM-P22	Fil. Bypass
C9	68	500	CM20A680J	1469-00007		5R5Q7		MS-47	AF Feedback

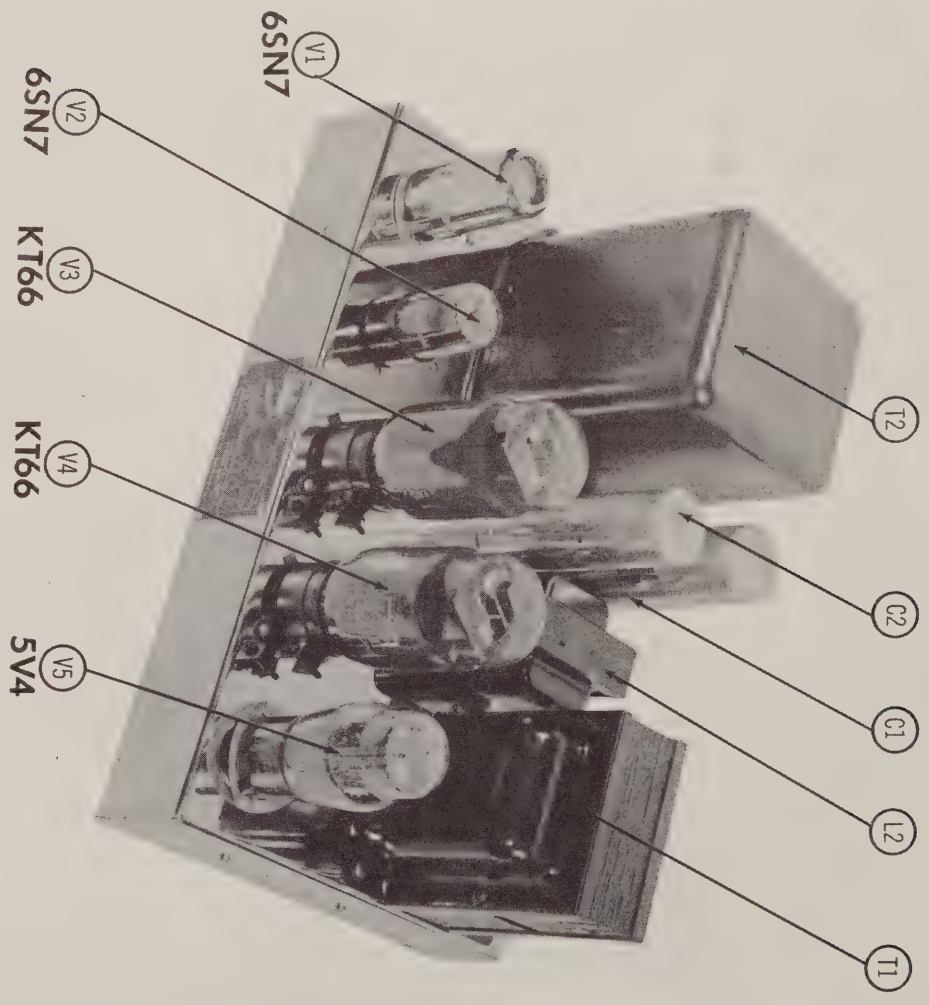
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Radio Craft. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1	100Ω	2	23S801	W-100	43-100	VK-121	Balance Control
R2	100Ω	2	23S802	W-100	43-100	VK-121	Bias Control

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Radio Craft. PART No.	IRC PART No.	
R3	470KΩ	½	RC20AE474K	BTS-470K	1st. AF Amp. Grid
R4	470Ω	½	RW047IJ	BW-½-470	1st. AF Amp. Cathode - Wire Wound
R5	2700Ω	½	RC20AE272J	BTS-2700	1st. AF Amp. Plate
R6	33KΩ	1	RC30AE333K	BTA-33K	1st. AF Amp. Decoupling
R7	47KΩ	1	RC30AE473K	BTA-47K	Phase Inverter Grid
R8	22KΩ	1	RC30AE223KB	BTA-22K	Phase Inverter Cathode
R9	22KΩ	1	RC30AE223KB	BTA-22K	Phase Inverter Plate
R10	22KΩ	1	RC30AE223K	BTA-22K	Phase Inverter Decoupling
R11	470KΩ	½	RC20AE474K	BTS-470K	2nd. AF Amp. Grid
R12	470KΩ	½	RC20AE474K	BTS-470K	2nd. AF Amp. Grid
R13	390Ω	½	RC20AE391K	BTS-390	2nd. AF Amp. Cathode
R14	47KΩ	2	RC40AE473KB	BTB-47K	2nd. AF Amp. Plate
R15	47KΩ	2	RC40AE473KB	BTB-47K	2nd. AF Amp. Plate
R16	100Ω	1	RC30AE101K	BTA-100	Bias Network
R17	100Ω	1	RC30AE101K	BTA-100	Bias Network
R18	1000Ω	½	RC20AE102K		Parasitic Suppressor
R19	1000Ω	½	RC20AE102K		Parasitic Suppressor
R20	100Ω	½	RC20AE101K		Parasitic Suppressor
R21	100Ω	½	RC20AE101K		Parasitic Suppressor
R22	100KΩ	½	RC20AE104K	BTS-100K	Output Grid
R23	100KΩ	½	RC20AE104K	BTS-100K	Output Grid
R24	400Ω	5	RW5401GB	1 3/4A-400	Output Cathode - Wire Wound
R25	400Ω	5	RW5401GB	1 3/4A-400	Output Cathode – Wire Wound
R26	4700Ω	½	RC20AE472J	BTS-4700	Feedback Network
R27	22KΩ	½	RC20AE223K	BTS-22K	Hum Balance

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	Radio Craft. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @1.25A	840VCT .145ADC	5VAC @2.0A	6.3VAC @3.7A	19S212	PC8412 ①	P-3155 ①	PV-200①

① Drill New Mounting Holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Radio Craft. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	8KΩ CT	16Ω 8Ω	340Ω CT	.9Ω .7Ω	19S014	A-8054			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	Radio Craft. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.145ADC	140Ω	5 Henries	19S408A	C-2309	C-2994 ②	TR-4200②	② Drill One New Mounting Hole
L2	.020ADC	750Ω	25 Henries	19S409	C-1003	C-2987	R-1230②	

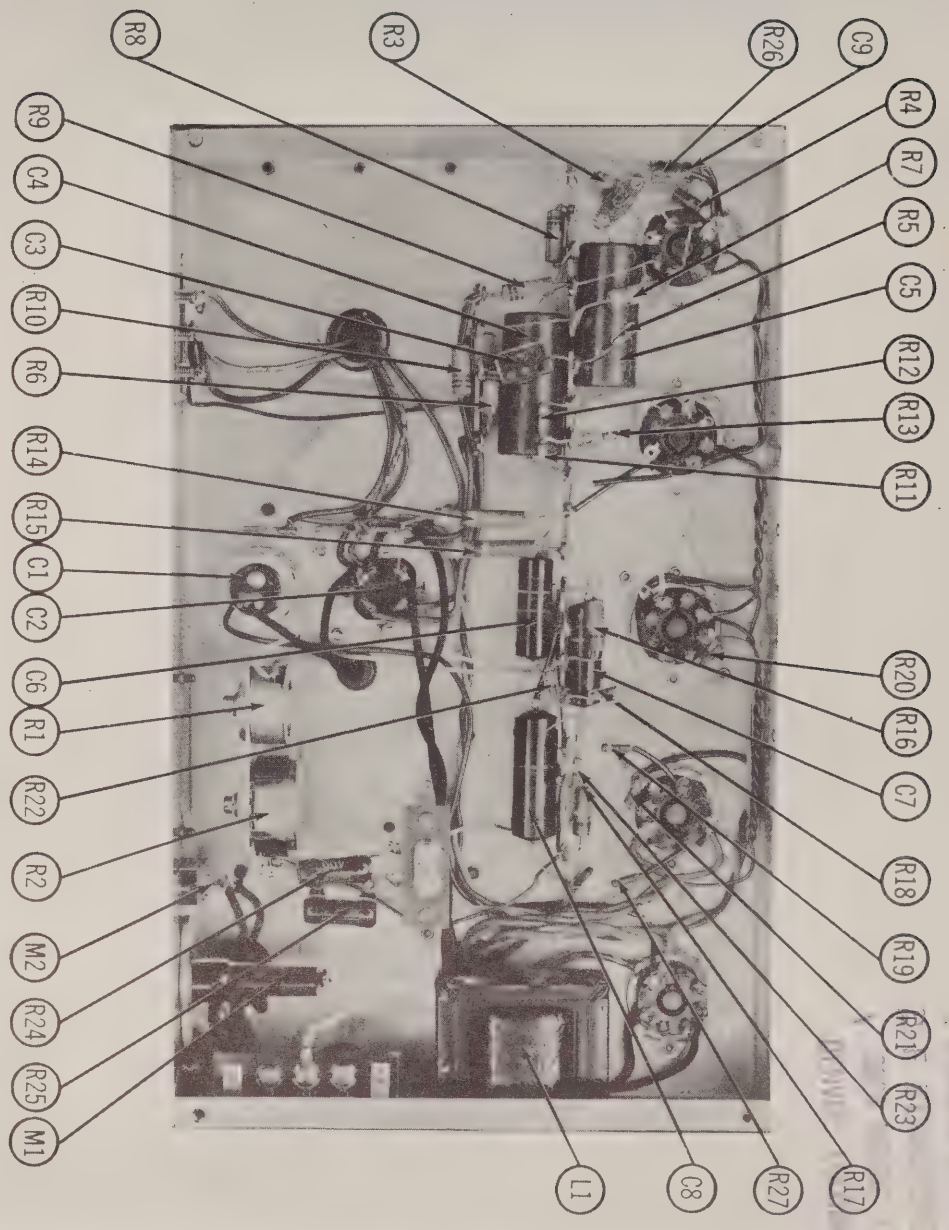
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			Radio Craft. PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	2A. 250V.			312002	341001	

MISCELLANEOUS

ITEM No.	PART NAME	Radio Craft. PART No.	NOTES
M2	Switch	4X010	On-Off
	Plug	13X602	Audio

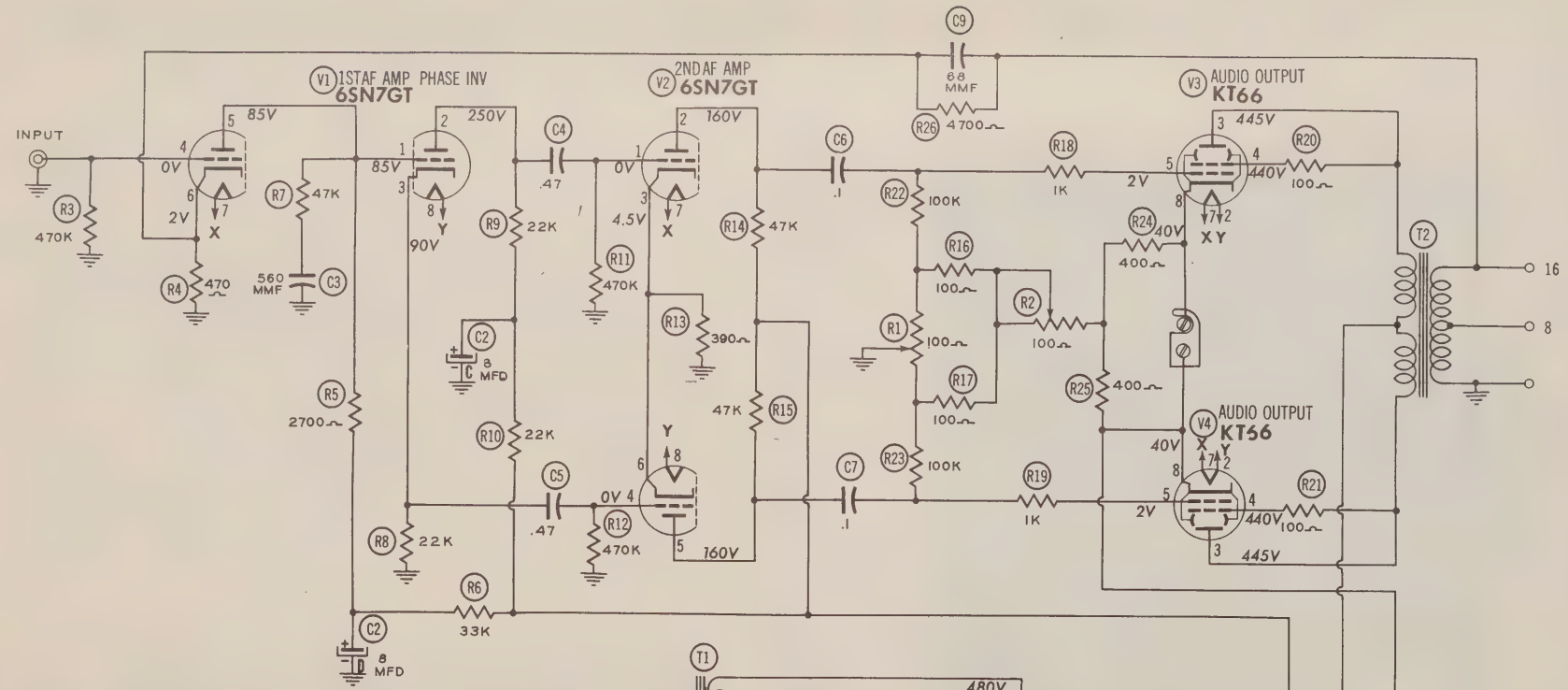
CHASSIS—BOTTOM VIEW



SET 164 FOLDER 8

RADIO CRAFTSMEN MODEL 500

RADIO CRAFTSMEN MODEL 500



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SN7GTA	†80KΩ	†45KΩ	22KΩ	470KΩ	†80KΩ	470Ω	¶.1Ω	¶0Ω
V 2	6SN7GTA	470KΩ	†48KΩ	390Ω	470KΩ	†48KΩ	390Ω	¶.1Ω	¶0Ω
V 3	KT66	0Ω	¶.1Ω	†310Ω	†410Ω	100KΩ	INF	¶0Ω	310Ω
V 4	KT66	0Ω	¶.1Ω	†310Ω	†410Ω	100KΩ	INF	¶0Ω	310Ω
V 5	5V4G	INF	120KΩ	INF	52Ω	INF	58Ω	INF	120KΩ

† MEASURED FROM PIN 8 OF V5
¶ MEASURED FROM PIN 7 OF V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1952

164-8

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 4917

SPARTON
MODELS 4916, 4918, 4920, 4921, 4922

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

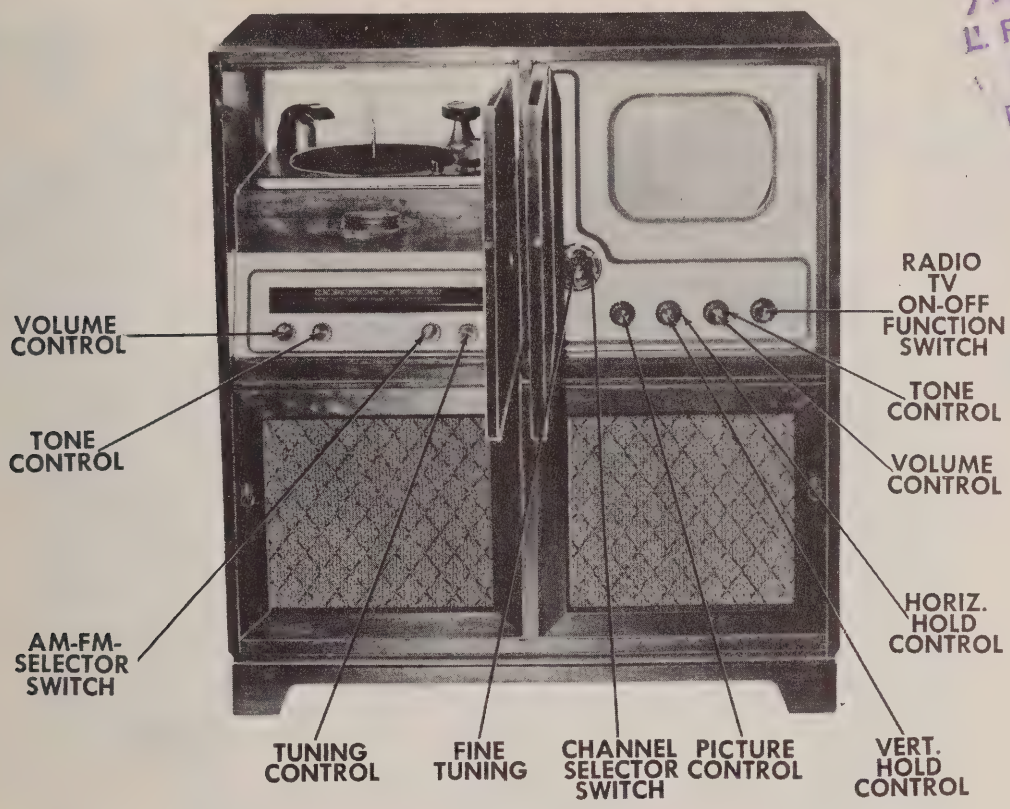
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 4-52 SET 164 FOLDER 9

PROPERTY OF
L. F. BLANK
MEADE ST.

SPARTON
MODELS 4916, 4918, 4920, 4921, 4922

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



SPARTON MODEL 4917

TRADE NAME	Sparton Models 4916, 4917, 4918, (Ch. 24TL10, PWR. Ch. 3TL10, Radio Ch. 6S10), 4920, 4921, 4922 (Ch. 24TM10, PWR. CH. 3TM10, Radio Ch. 6S10)
MANUFACTURER	Sparks - Withington Co., Jackson, Mich.
TYPE SET	TV-AM-FM-Phono-Combination Receiver
TUBES	Thirty-Four

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.9A @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13

INDEX

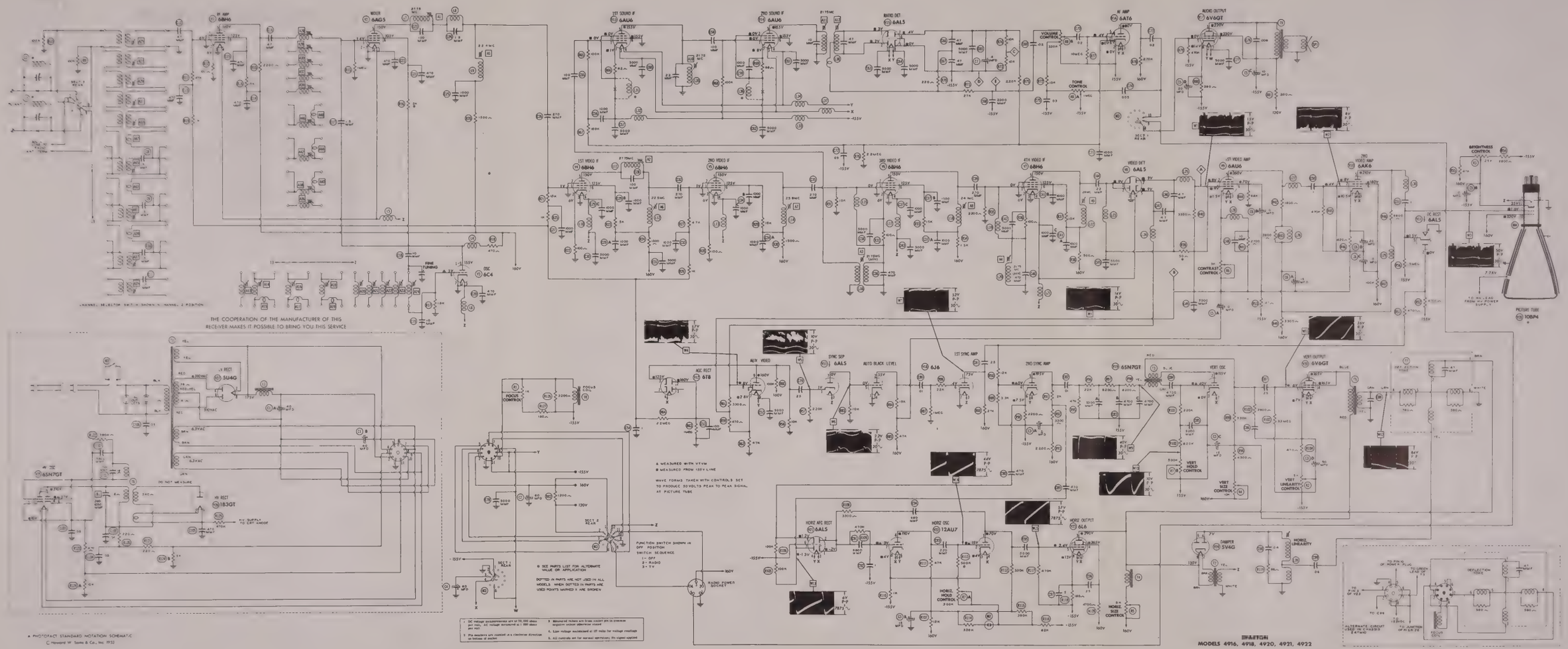
Alignment Instructions 6, 7
Drive Cord Stringing 8
Disassembly Instructions 11
H.V. Osc. Adjustments 11
Parts List and Descriptions ..... 14 thru 18
Photographs
Cabinet - Rear View 11
Capacitor and Alignment Identification (Radio) 20
Capacitor and Alignment Identification (TV) 4
Chassis Bottom View (Power Supply) 13
Chassis Top View (Power Supply) 19
Photographs (cont.)
Chassis - Top View (Radio) 19
Chassis - Top View (TV) 3
RF Tuner 10
Resistor & Inductor Identification (Radio) 20
Resistor & Inductor Identification (TV) 12, 21
Resistance Measurements 8
Schematic (Radio) 22
Schematic (TV) 2
Tube Placement Charts 5

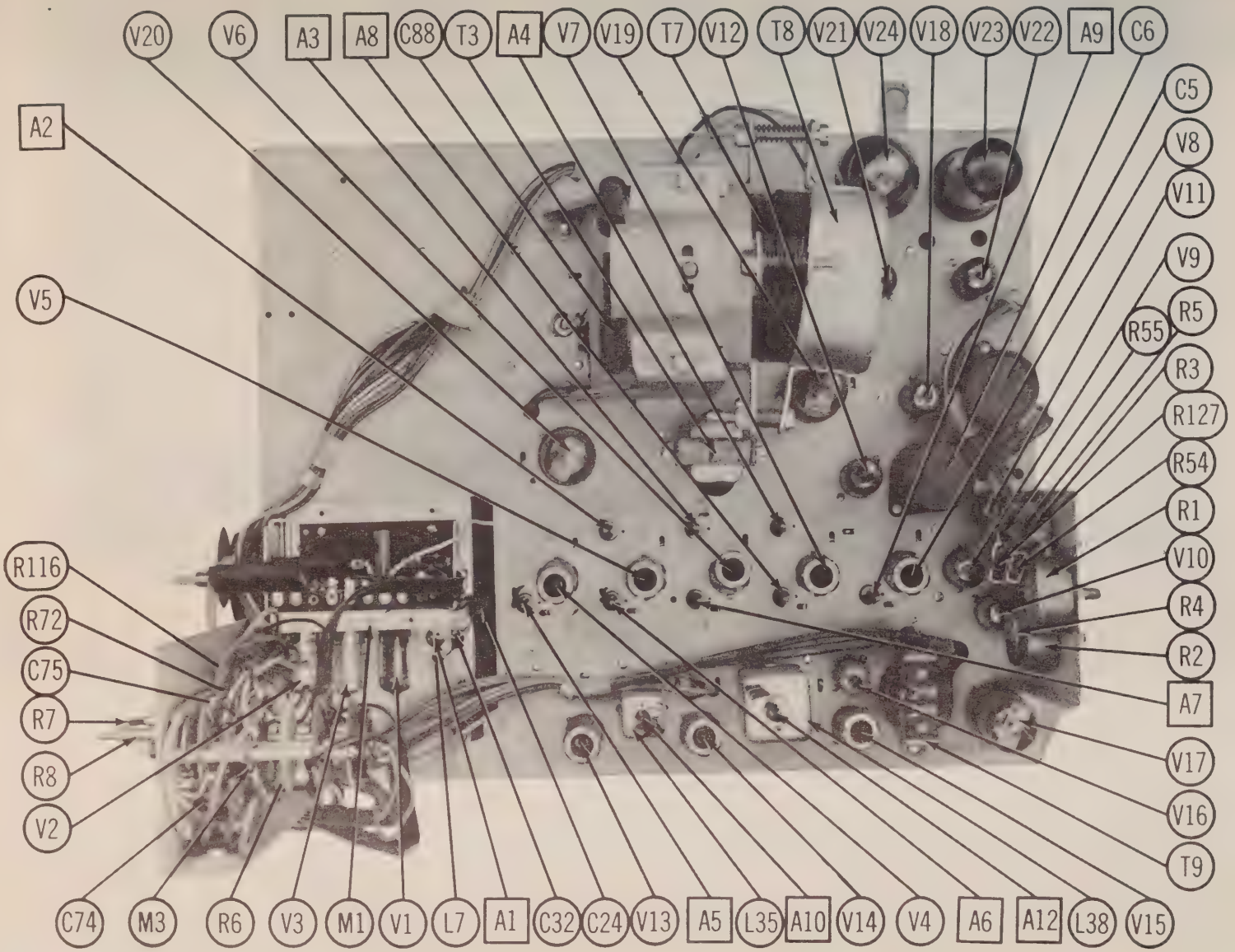
FOR SERVICE INFORMATION ON RECORD CHANGER UNIT SEE VM MODEL 800-D PHOTOFACT SET #84 FOLDER #12 OR RECORD CHANGER MANUAL CM-2.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

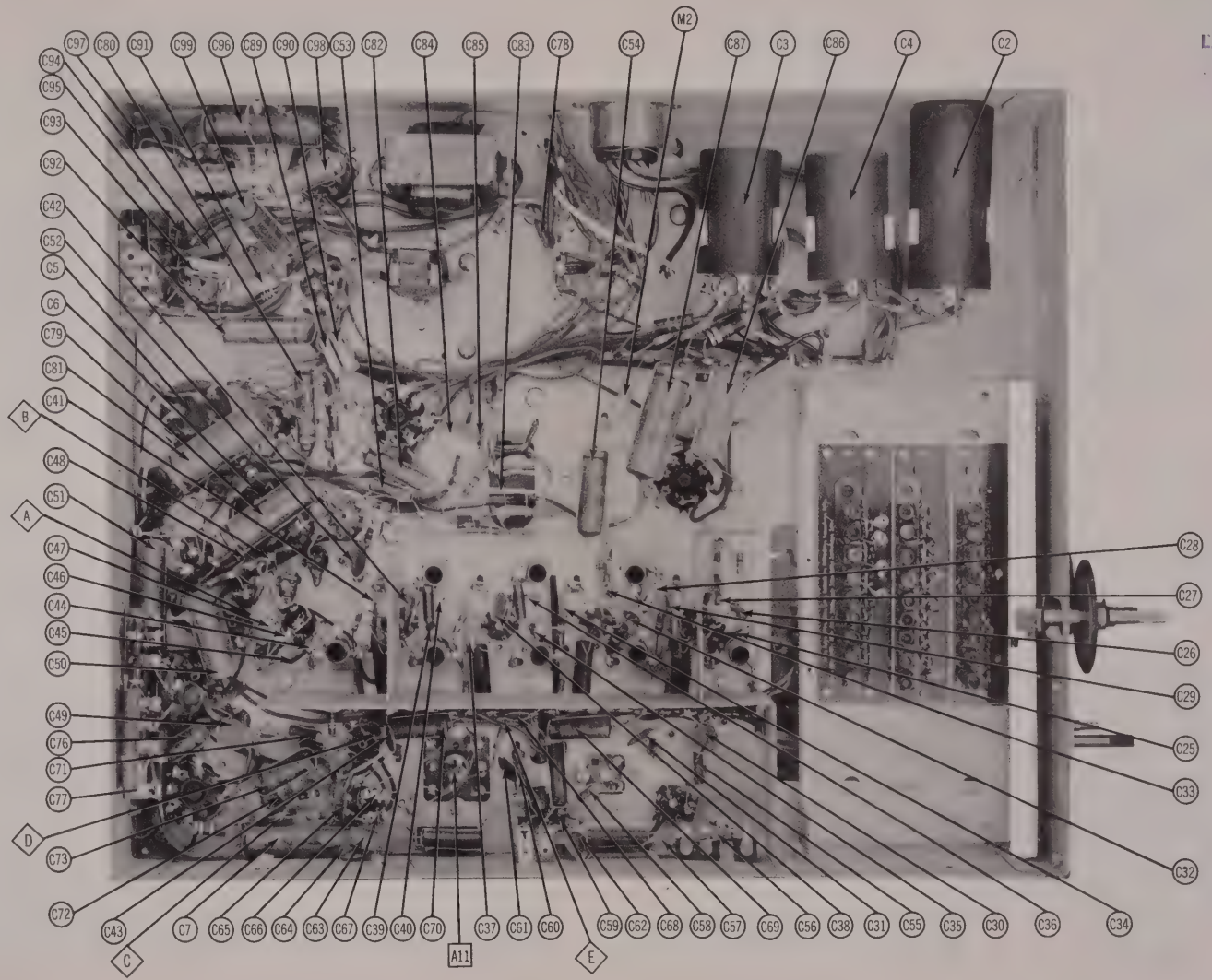
SPARTON
MODELS 4916, 4918, 4920, 4921, 4922


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1952
SPARTON
MODELS 4916, 4918, 4920, 4921, 4922
SPARTON MODELS 4916, 4918, 4920, 4921, 4922



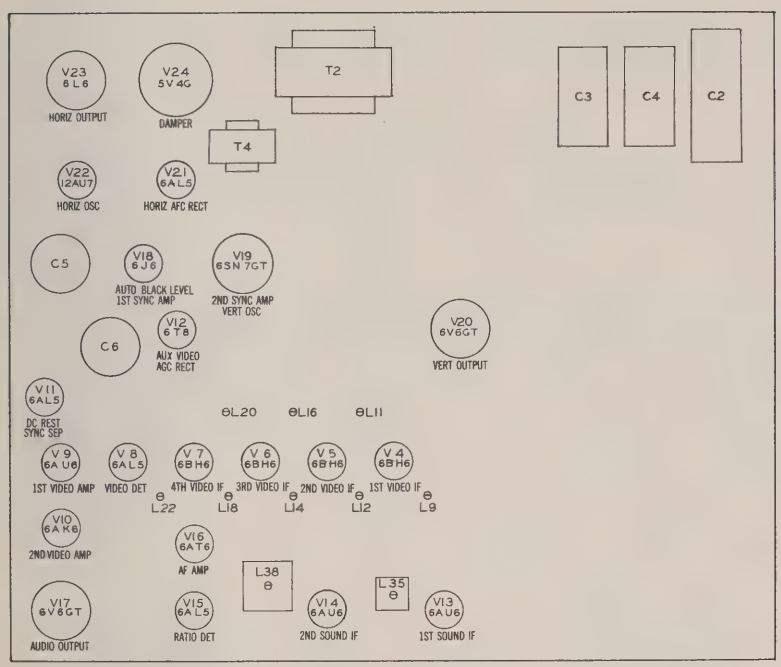
CHASSIS TOP VIEW

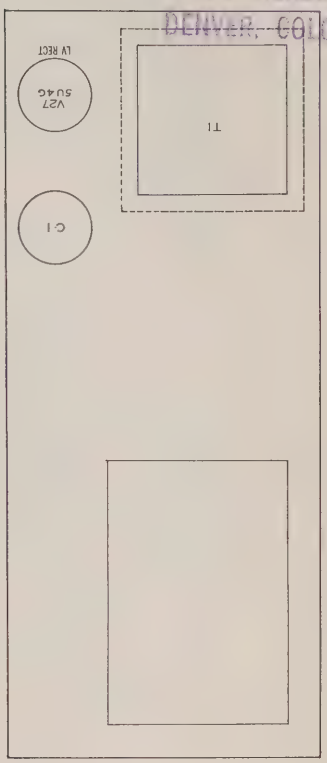
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO



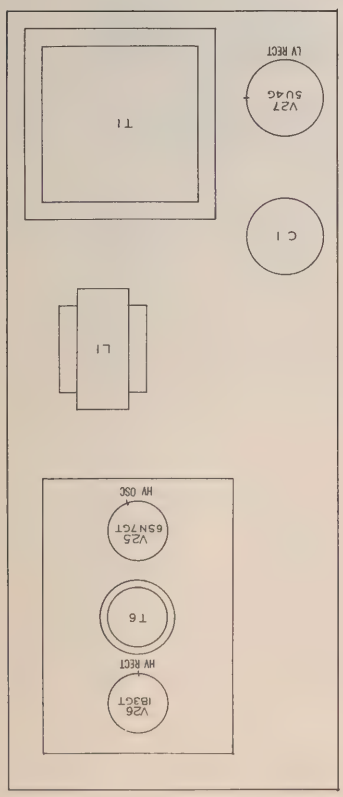
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

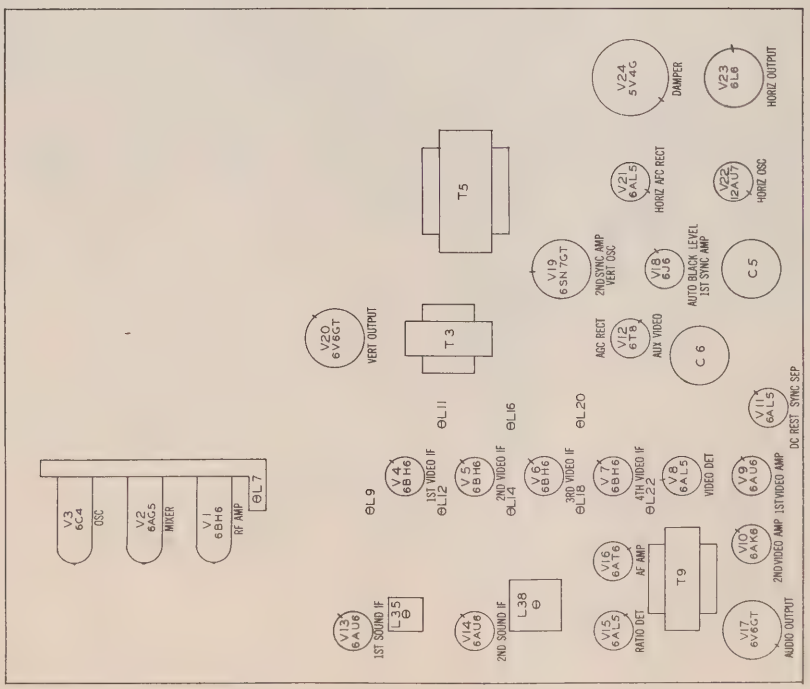
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO





BOTTOM VIEW





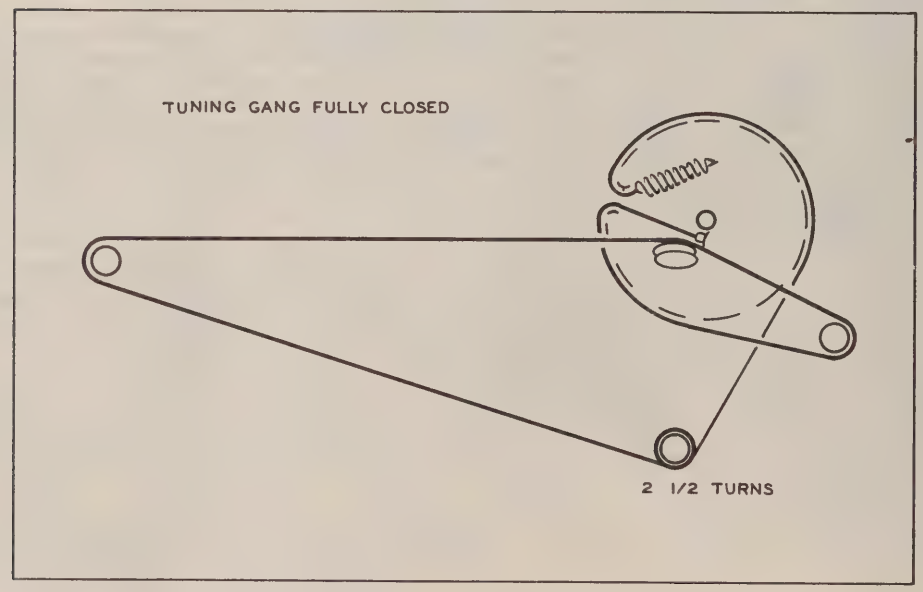
TOP VIEW

TUBE PLACEMENT CHART

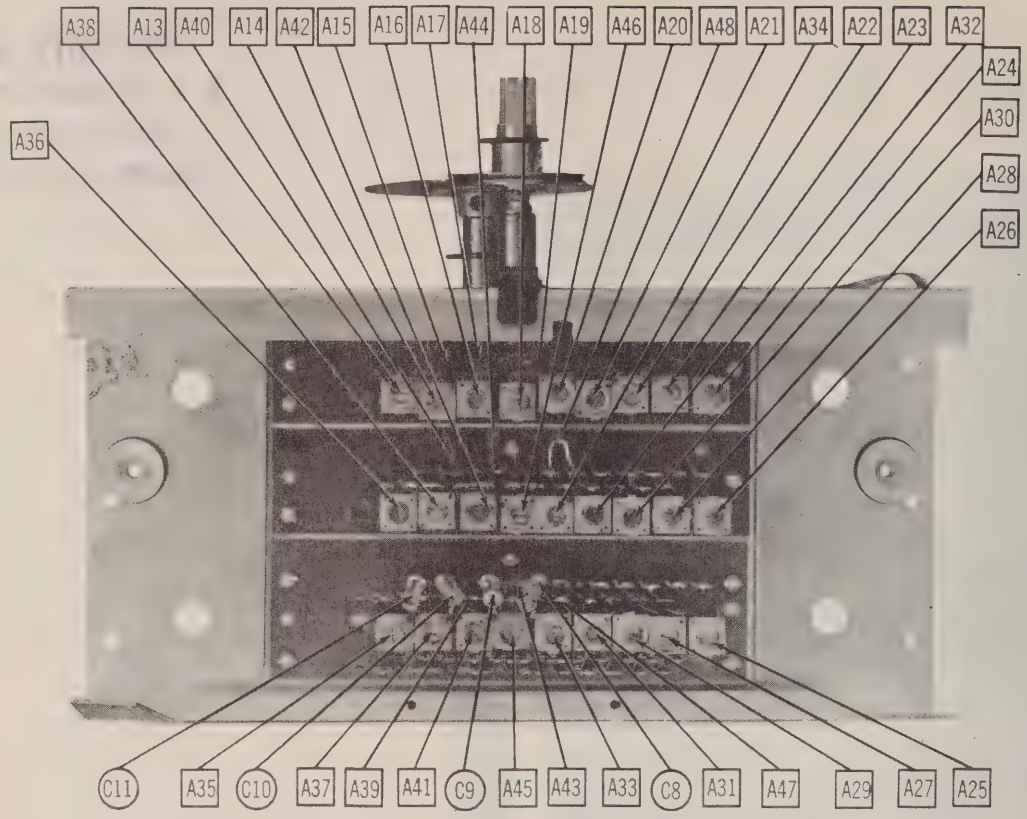
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	3.2Meg	100Ω	0Ω	.2Ω.	†2.2KΩ	†15KΩ	0Ω		
V 2	6AG5	1Meg	0Ω	0Ω	.2Ω	†1.5KΩ	†15KΩ	0Ω		
V 3	6C4	†540Ω	INF	.2Ω	0Ω	†540Ω	18KΩ	0Ω		
V 4	6BH6	3.2Meg	100Ω	0Ω	.2Ω	†1.5KΩ	†16KΩ	0Ω		
V 5	6BH6	3.2Meg	100Ω	0Ω	.2Ω	†1.5KΩ	†16KΩ	0Ω		
V 6	6BH6	1.8Ω	100Ω	0Ω	.2Ω	†1.5KΩ	†16KΩ	0Ω		
V 7	6BH6	1.8Ω	100Ω	0Ω	.2Ω	†1.5KΩ	†16KΩ	0Ω		
V 8	6AL5	■200Ω	■200Ω	0Ω	.1Ω	■3.3KΩ	0Ω	■3.3KΩ		
V 9	6AU6	■3.3KΩ	■47Ω	■.1Ω	■0Ω	†5.1KΩ	68KΩ	■60Ω		
V 10	6AK6	■470KΩ	■47Ω	■.1Ω	■0Ω	†10KΩ	†80KΩ	■870Ω		
V 11	6AL5	220KΩ	■3.8KΩ	.1Ω	0Ω	■1.5Meg	0Ω	10KΩ		
V 12	6T8	INF	1Meg	10KΩ	■.1Ω	■0Ω	INF	■515Ω	■3.3KΩ	10KΩ
V 13	6AU6	■400KΩ	■.2Ω	■.1Ω	■.2Ω	.3Ω	0Ω	■82Ω		
V 14	6AU6	■100KΩ	■.1Ω	■.1Ω	■.2Ω	.5Ω	0Ω	■68Ω		
V 15	6AL5	INF	INF	■.1Ω	■0Ω	■0Ω	■0Ω	■20KΩ		
V 16	6AT6	■10Meg	■0Ω	■.1Ω	■0Ω	■200KΩ	■200KΩ	†270KΩ		
V 17	6V6GT	0Ω	■0Ω	†2.6KΩ	†2.4KΩ	■470KΩ	■470KΩ	■.1Ω	■390Ω	
V 18	6J6	†27KΩ	†62KΩ	.1Ω	0Ω	10KΩ	1Meg	0Ω		
V 19	6SN7GT	■1.3Meg	†335KΩ	■0Ω	■3.3KΩ	†17KΩ	■2.2KΩ	■.1Ω	■0Ω	
V 20	6V6GT	0Ω	■0Ω	†8KΩ	†8KΩ	■3.3Meg	■0Ω	■.1Ω	■2.1KΩ	
V 21	6AL5	INF	INF	■0Ω	■.1Ω	■100KΩ	■0Ω	■100KΩ		
V 22	12AU7	†340KΩ	■720KΩ	■1KΩ	■.1Ω	■.1Ω	†60KΩ	INF	■1KΩ	■0Ω
V 23	6L6	0Ω	■0Ω	†500Ω	†4.7KΩ	■470KΩ	INF	■.1Ω	■180Ω	
V 24	5V4G	INF	†500Ω	INF	16Ω	68Ω	16Ω	INF	†500Ω	
V 25	6SN7GT	■4.3KΩ	†510Ω	■470Ω	■4.3KΩ	†510Ω	■470Ω	■.1Ω	■0Ω	
V 26	1B3GT	PINS 1-8 HAVE INF RESISTANCE								Top Cap †935Ω
V 27	5U4G	INF	4.2KΩ	INF	■180Ω	INF	■180Ω	INF	4.2KΩ	
V 28	10BP4	0Ω	■1.5Meg	Pin 10 †70Ω	Pin 11 ■8KΩ	Pin 12 .1Ω				

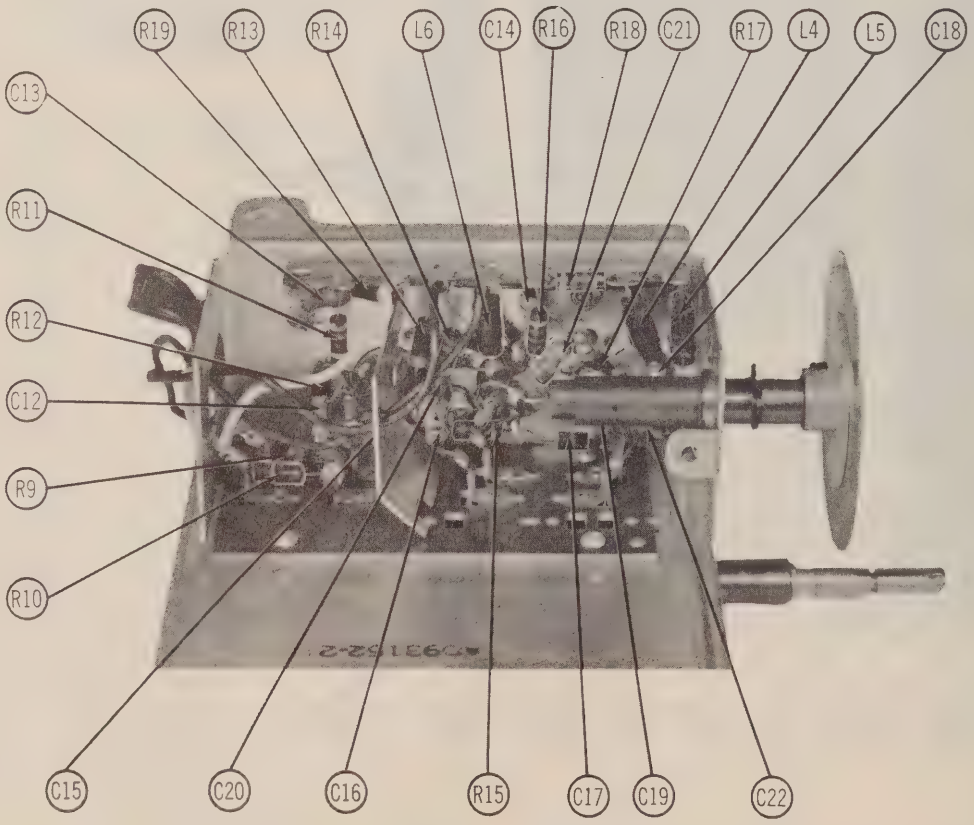
ALL MEASUREMENTS TAKEN WITH M3 IN TV POSITION.
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V27
■ MEASURED FROM -155VDC LINE



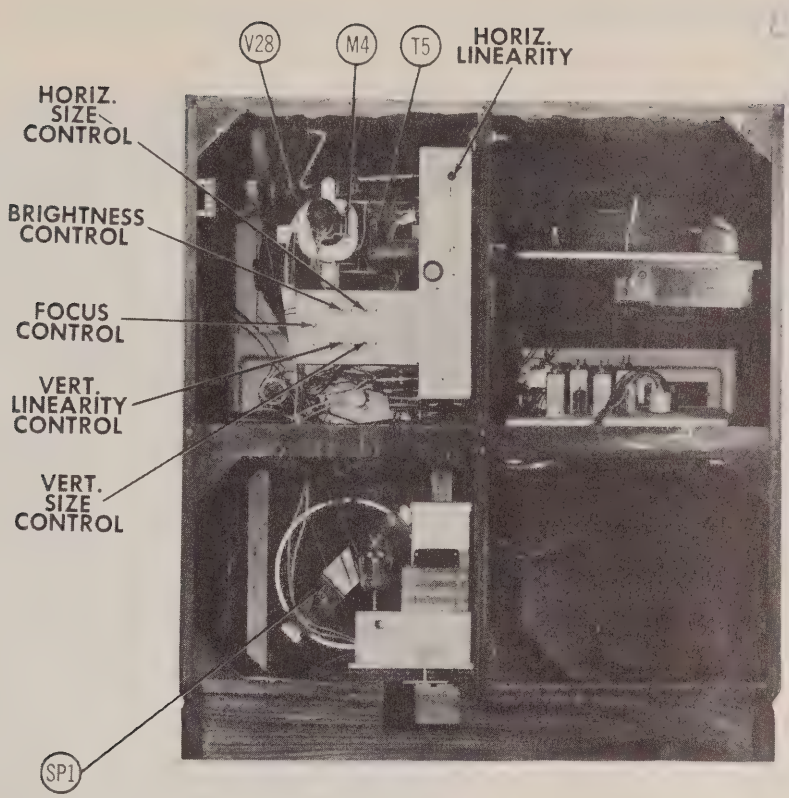
DIAL DRIVE STRINGING



RF TUNER-BOTTOM VIEW



RF TUNER- SIDE VIEW



CABINET-REAR VIEW

H.V. OSCILLATOR ADJUSTMENTS

The high voltage output may be varied by adjustment of trimmer B1 which is located in the high voltage compartment. This trimmer is adjusted for approximately 10KV on the high capacity side of the high voltage peak. This setting gives maximum effeciency and regulation.

DISASSEMBLY INSTRUCTIONS

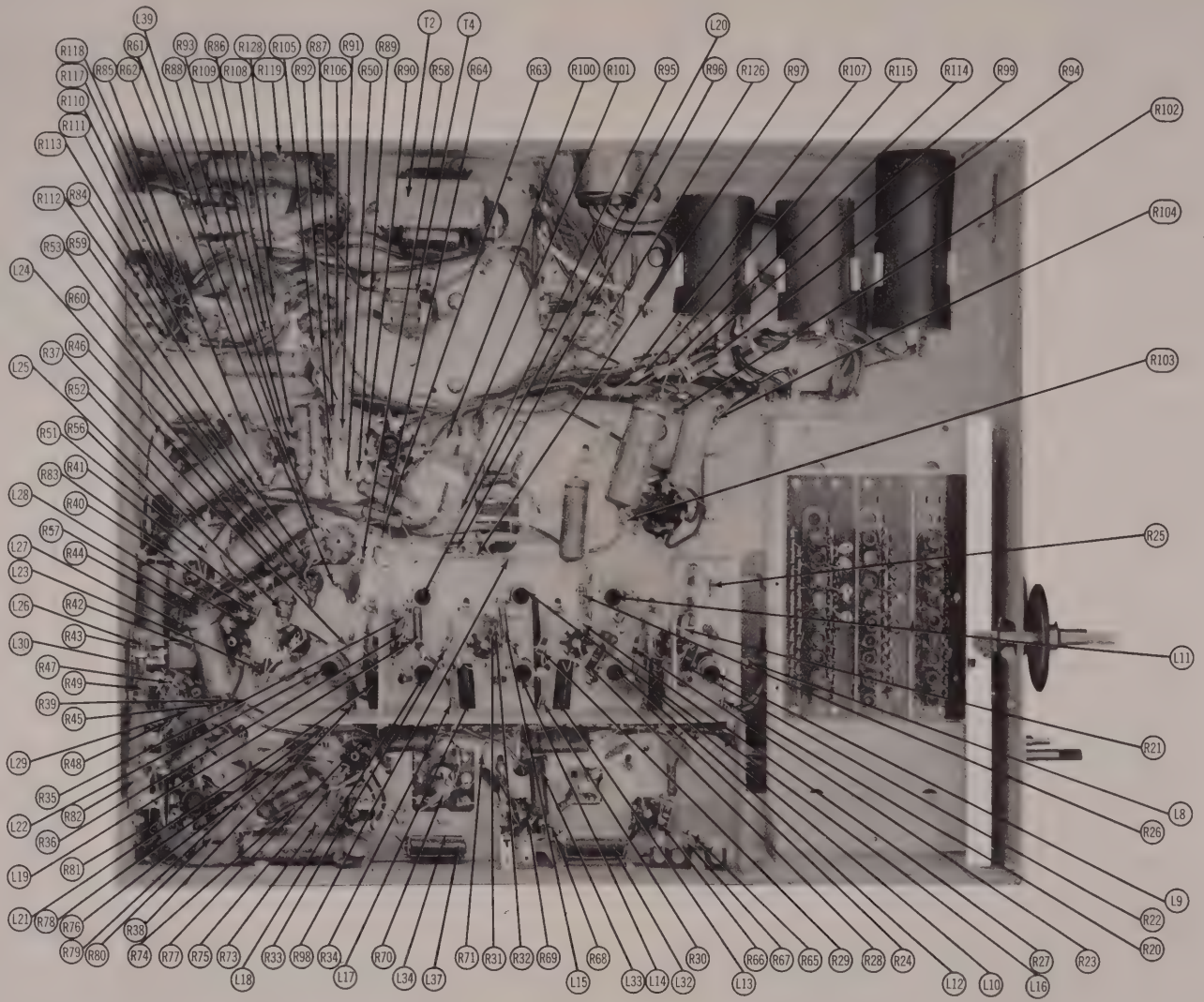
TV

1. Remove 8 push on type Control Knobs from front Panel.
2. Remove 4 wood screw & 2 metal screw from rear cover to TV Chassis.
3. Disconnect Picture Tube
4. Disconnect HV lead to Picture Tube.
5. Disconnect Power Plug to Phono.
6. Disconnect Power Plug to Radio
7. Disconnect Power Plug to TV
8. Disconnect Antenna Leads to Radio
9. Remove L Bracket from top of Cabinet.
10. Remove 4 Chassis Bolts.
11. Remove 2 wood screws and Antenna Bracket
12. Remove 2 Chassis Bolts and remove Power Supply Unit.
13. Remove 2 nuts holding speaker. Remove speaker.

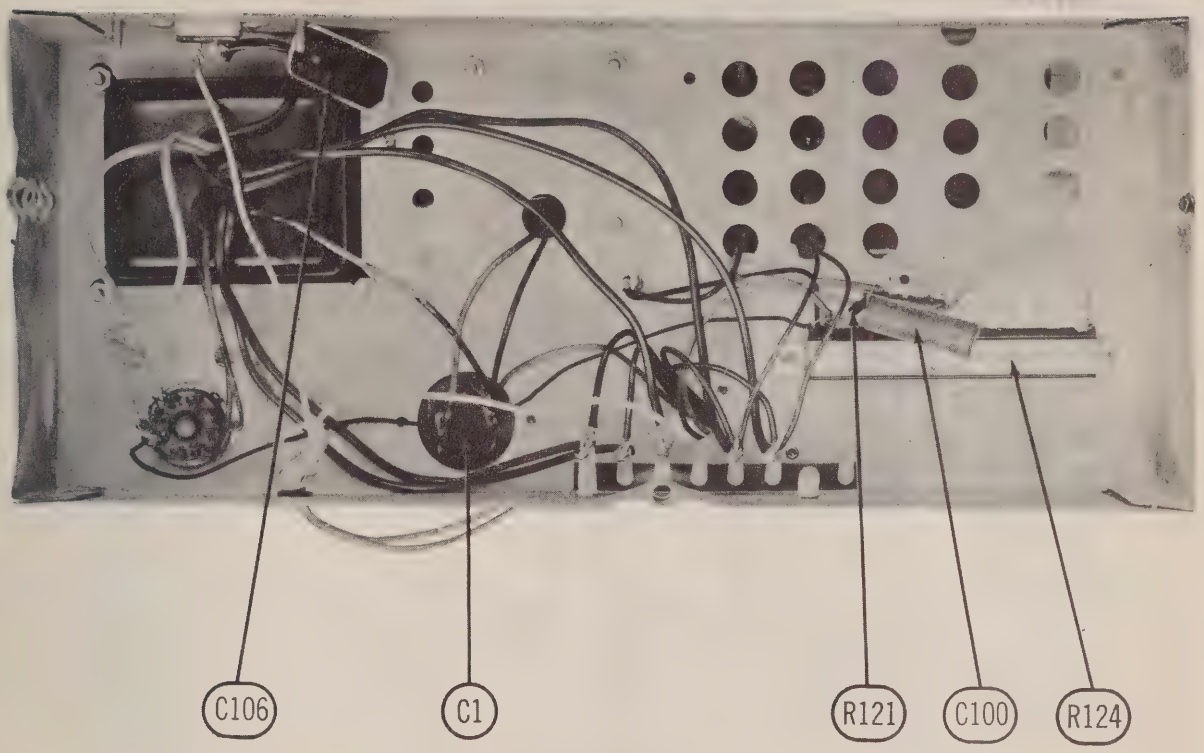
Note. For Picture Tube Removal it is necessary to remove main chassis as outlined above.

Radio

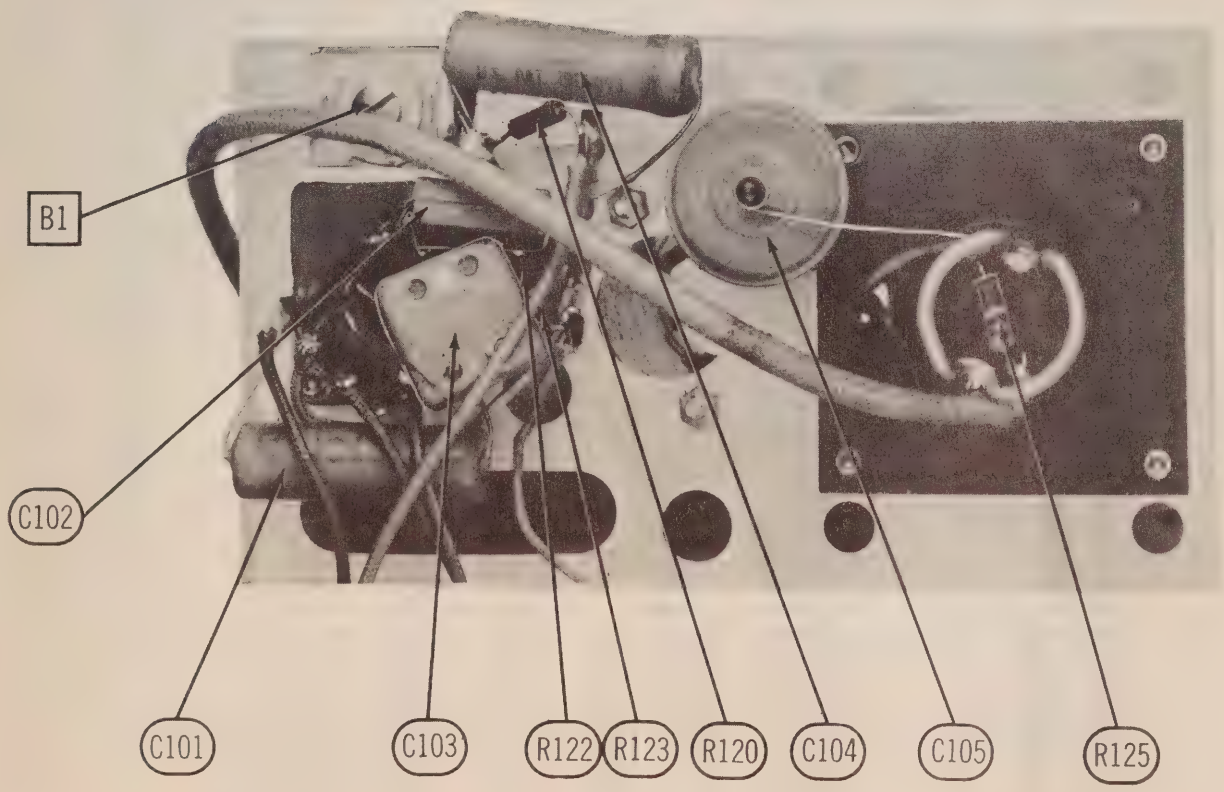
1. Remove 4 push on type Control Knobs from front panel.
2. Remove 12 wood screws holding rear cover. Remove cover.
3. Disconnect Antenna leads from Radio.
4. Disconnect Power Plug from Radio
5. Disconnect Phono Lead from Radio.
6. Remove 4 metal screws holding Chassis. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



POWER SUPPLY CHASSIS-BOTTOM VIEW



POWER SUPPLY **SUB** CHASSIS-BOTTOM VIEW

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		SPARTON PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BH6	6BH6	7CM	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6C4	6C4	6BG	
V4	1st. Video IF Amp.	6BH6	6BH6	7CM	
V5	2nd. Video If Amp.	6BH6	6BH6	7CM	
V6	3rd. Video IF Amp.	6BH6	6BH6	7CM	
V7	4th. Video IF Amp.	6BH6	6BH6	7CM	
V8	Video Detector	6AL5	6AL5	6BT	
V9	1st. Video Amp.	6AU6	6AU6	7BK	
V10	2nd. Video Amp	6AK6	6AK6	7BK	
V11	DC Rest.-Sync. Seperator	6AL5	6AL5	6BT	
V12	Aux. Video-AGC Rectifier	6T8	6T8	9E	
V13	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V14	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V15	Ratio Detecter	6AL5	6AL5	6BT	
V16	AF Amplifier	6AT6	6AT6	7BT	
V17	Audio Output	6V6GT	6V6GT	7AC	
V18	Auto Blanking level-1st Sync. Amplifier	6J6	6J6	7BF	
V19	2nd. Sync. Amp. Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V20	Vert. Output	6V6GT	6V6GT	7AC	
V21	Horiz. AFC Rect.	6AL5	6AL5	6BT	
V22	Horiz. Oscillator	12AU7	12AU7	9A	
V23	Horiz. Output	6L6	6L6	7AC	
V24	Damper	5V4G	5V4G	5L	
V25	HV Oscillator	6SN7GT	6SN7GT	8BD	
V26	HV Rectifier	1B3GT	1B3GT	3C	
V27	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	SPARTON PART No.	SYLVANIA PART No.			
V28A	10BP4	10BP4		12D	
B	12BP4	12BP4		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450	PA-4307-7	AFH2-57		UPT4445		TVL-2764	▲ Filter
B	40	450							▲ Filter
C2	80	400	PA-4309-3	AFH1-47		UP8040		TVL-1675	Filter
C3A	15	350	PA-4307-6	AFH4-54		UPT15T35		TVL-4708	■ Decoupling
B	15	350				V5		TVA-1308	▲ Horiz. MV Dec.
C	15	350							▲ Vert. Output Dec.
D	50	50							Vert. Output Cathode
C4	80	300	PA-4309-1	AFH1-35		UP8035		TVL-1573	Bias Filter
C5A	10	350	PA-4307-5	AFH4-60		UPT1115C		TVL-4723	▲ Decoupling
B	10	350							▲ Picture Tube Cathode
C	10	350							■ Audio Output Dec.
D	20	25							Audio Output Cathode
C6A	15	450	PA-4307-8	AFH4-65		UPT1145C		TVL-4723	▲ Decoupling
B	10	450							▲ 1st. Video Amp. Screen
C	10	450							■ 2nd. Video Amp. Screen
D	20	25							2nd. Video Amp. Cathode
C7	4	50	PA-4303-12	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C8	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Trimmer
C9	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Trimmer
C10	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Trimmer
C11	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Trimmer
C12	47			SI47	D6-470		GP1K-470	5GA-Q47	RF Coupling
C13	470			SI470	D6-471		GP2K-471	5GA-T47	AGC Filter
C14	470			SI470	D6-471		GP2K-471	5GA-T47	RF Amp. Plate Dec.
C15	470			SI470	D6-471		GP2K-471	5GA-T47	RF Amp. Screen Bypass
C16	47			SI47	D6-470		GP1K-470	5GA-Q47	RF Coupling
C17	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		Osc. Coupling
C18	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Osc. Feedback
C19	10						N330K-100		Fixed Trimmer
C20	470			SI470	D6-471		GP2K-471	5GA-T47	Osc. Fil. Bypass
C21	470			SI470	D6-471		GP2K-471	5GA-T47	Mixer Screen Bypass
C22	470			SI470	D6-471		GP2K-471	5GA-T47	Mixer Fil. Bypass
C23	100			SI100NP0	TCZ-100		NP0-333-101	5TCC-T1	Fixed Trimmer
C24	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		Fixed Trimmer
C25	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Mixer Plate Dec.
C26	270			SI270	D6-271	5R5T3	GP2K-271	5GA-T27	IF Coupling
C27	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	AGC Filter
C28	100			SI100NP0	TCZ-100		NP0-333-101	5TCC-T1	Fixed Trimmer
C29A	1000		PA-4339-2	BPD-001	DD-102	1W5D1	801-001	5HK-D1	1st Video IF Plate
B	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	1st Video IF Screen
C	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	1st Video IF Fil.
C30	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Fil. Bypass †
C31	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass †
C32	270			SI270	D6-271	5R5T3	GP2K-271	5GA-T27	IF Coupling
C33	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	AGC Filter
C34A	1000		PA-4339-2	BPD-001	DD-102	1W5D1	801-001	5HK-D1	2nd Video IF Plate
B	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	2nd Video IF Screen
C	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	2nd Video IF Fil.
C35	270			SI270	D6-271	5R5T3	GP2K-271	5GA-T27	IF Coupling
C36	470	500		1469-0005		5R5T5		MS-35	Fixed Trimmer
C37A	1000		PA-4339-2	BPD-001	DD-102	1W5D1	801-001	5HK-D1	3rd Video IF Plate
B	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	3rd Video IF Screen
C	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	3rd Video IF Fil.
C38	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd Video IF Cathode †

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C39	270			SI270	D6-271	5R5T3	GP2K-271	5GA-T27	IF Coupling
C40	470	500		1469-0005		5R5T5		MS-35	Fixed Trimmer
C41A	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	4th Video IF Plate
B	1000		PA-4339-2	BPD-001	DD-102	1W5D1	801-001	5HK-D1	4th Video IF Screen
C	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	4th Video IF Fil.
C42	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	4th Video IF Cathode †
C43	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Fil. Bypass †
C44	22				TCZ-22		NP0K-220	5TCC-Q22	IF Coupling
C45	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Bias Filter †
C46	4.7			SI4.7NP0	TCZ-4.7		NP0K-4R7		Video Det. Filter
C47	4.7			SI4.7NP0	TCZ-4.7		NP0K-4R7		Video Det. Filter
C48	10			SI10	D6-100	5W5Q1	GP1K-100	5GA-Q1	1st Video Amp. Cathode
C49	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Bias Filter †
C50	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C51	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C52	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Rect. Fil. †
C53	100			SI100NP0	TCZ-100		NP0-333-10	5TCC-T1	AGC Filter
C54	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	AGC Filter
C55	100			SI100NP0	TCZ-100		NP0-333-101	5TCC-T1	Sound IF Coupling
C56	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	AVC Filter
C57	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Bias Filter †
C58	100			SI100	D6-101	5W5T5	GP1K-101	5GA-T1	Sound IF Coupling
C59	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	2nd Sound IF Cathode
C60	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Sound IF Fil. †
C61	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Sound IF Fil. †
C62	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Bias Filter †
C63	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Ratio Det. Fil. †
C64	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Ratio Det. Fil. †
C65	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass †
C66	47				TCZ-47		NP0L-470	5TCC-Q47	Diode Load Cap.
C67	47				TCZ-47		NP0L-470	5TCC-Q47	Diode Load Cap.
C68	2000			BPD-002	DD-202	1W5D2	801-002	5HK-D2	De-emphasis
C69	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C70	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C71	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	AVC Filter
C72	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C73	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C74	.005	200		P888-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C75	.03	200		P488-03		PTE6S3		6TM-S3	Tone Comp.
C76	.006	600		P688-006		PTE6D6	GP2-333-602	6TM-D6	Audio Output Plate
C77	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Audio Output Fil.
C78	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Audio Output Fil. †
C79	.25	200		P488-25		GT2P25		2TM-P25	Sync. Coupling
C80	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Sync. Coupling
C81	.25	400		P488-25		GT4P25		4TM-P25	Sync. Coupling
C82	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. Sync. Coupling
C83A	3300			SI3300	D6-332		GP2-333-332	5HK-D33	Vert. Integrator Net.
B	4700		PA-4339-1	SI4700	D6-472		GP2-333-472	5HK-D47	Vert. Integrator Net.
C	4700			SI4700	D6-472		GP2-333-472	5HK-D47	Vert. Integrator Net.
C84	4700	500		1464-005		1DR5D5		MS-25	Vert. Osc. Grid Cap.
C85	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Bias Filter †
C86	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Vert. Discharge
C87	.25	400		P488-25		GT4P25		4TM-P25	Vert. Sweep Coupling
C88	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	Fixed Trimmer
C89	470	500		1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sync. Coupling
C90	470	500		1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sync. Coupling
C91	6800	500		1467-007	D6-682	1D3D7	GP2-333-682	1FM-27	Horiz. AFC Filter
C92	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	Horiz. AFC Filter
C93	220	500		1469-00025		5R5T25			Horiz. MV Feedback
C94	680	500		1479-0007		2R5T7		MS-37	Horiz. Discharge
C95	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Horiz. Sweep Coupling †
C96	.25	400		P488-25		GT4P25		4TM-P25	Horiz. Output Screen
C97	.5	200		P288-5		GT2P5		2TM-P5	Horiz. Output Cathode
C98	.04	200		P288-04		PTE6S4		6TM-S4	Damper Filter
C99	.06	400		684-06				6TM-S5	Horiz. Sweep Coupling
C100	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	HV Osc. Decoupling
C101	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	HV Osc. Cathode Bypass
C102	1500	500		1464-0015		1R5D15			Fixed Trimmer
C103	5600	500		1464-006				MS-26	HV Osc. Grid Cap.
C104	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	RF Bypass
C105	470	20000		HV20A					HV Filter
C106	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Line Filter

† Some Models use 4700MMF in this application

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1	1000Ω	4	PA4410		RTV-278	SVP-993	Focus Control - Wire Wound
R2	5KΩ	2	PA4411	W-5000	43-5000	VK-135	Vert. Linearity Control - Wire Wound
R3A	25KΩ	1	PA4412	Q11-120	AG-40-S	AN-26	Brightness Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R3A per instructions.
R4	10KΩ	2	PA4413	W-10K	43-10K	VK-137	Vert. Size Control - Wire Wound
R5	5KΩ	2	PA4411	W-5000	43-5000	VK-135	Horiz. Size Control - Wire Wound
R6	3000Ω	2	PA4421	W-3000	RTV-202	V-133	Contrast Control - Wire Wound
				"Concentrikit"			
R7A	300KΩ	1/2	PA4422	B11-131 *		SBB-698	Horiz. Hold Control - Panel
B	500KΩ	1/2		B11-133 *			Vert. Hold Control - Rear
C	Shaft End		Not Req.	E187 *		Not Req.	Attach per instructions in "Concentrikit"
				"Concentrikit"			
R8A	1Meg	1/2	PA4420	B11-137 *		SBBT-577	Tone Control - Panel
B	330KΩ	1/2		B18-132X *			Volume Control - Tapped @ 60KΩ - Rear
C	Shaft End		Not Req.	E187 *		Not Req.	Attach per instructions in "Concentrikit"

* Additional parts to be used with "Concentrikit"

PROPERTY OF
F. BLANKENSHIP
1324 WILLOW ST
DENVER, COLORADO

TV PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R9	100KΩ 20%	1			Antenna Loading
R10	100KΩ 20%	1			Antenna Loading
R11	47K	1		BTS-47K	RF Amp. Grid
R12	100Ω	1		BTS-100	RF Amp. Cathode
R13	2200Ω 5%	1		BTS-2200 5%	RF Amp. Plate
R14	15KΩ	1		BTS-15K	RF Amp. Screen
R15	1Meg	1		BTS-1Meg	Mixer Grid
R16	15KΩ	1		BTS 15K	Mixer Screen - See note 1.
R17	18KΩ	1		BTS-18K	Osc. Grid
R18	470Ω	1		BTS-470	Osc. Plate
R19	1000Ω	1		BTS-1000	AGC Network
R20	1500Ω 20%	1		BTS-1500	Mixer Plate Decoupling
R21	15KΩ 5%	1		BTS-15K 5%	1st Video IF Amp. Grid
R22	100Ω	1		BTS-100	1st Video IF Amp. Cathode
R23	15KΩ	1			1st Video IF Amp. Screen
R24	1500Ω 20%	1		BTS 1500	1st Video IF Amp. Decoupling
R25	1000Ω 20%	1		BTS 1000	AGC Network
R26	1000Ω 20%	1		BTS-1000	AGC Network
R27	4700Ω 5%	1		BTS-4700 5%	2nd Video IF Amp. Grid
R28	100Ω	1		BTS-100	2nd Video IF Amp. Cathode
R29	15KΩ	1			2nd Video IF Amp. Screen
R30	1500Ω 20%	1		BTS-1500	2nd Video IF Amp. Decoupling
R31	15KΩ 5%	1		BTS-15K 5%	3rd Video IF Amp. Grid
R32	100Ω	1		BTS-100	3rd Video IF Amp. Cathode
R33	15KΩ	1			3rd Video IF Amp. Screen
R34	1500Ω 20%	1		BTS-1500	3rd Video IF Amp. Decoupling
R35	2200Ω 5%	1		BTS-2200 5%	4th Video IF Amp. Grid
R36	100Ω	1		BTS-100	4th Video IF Amp. Cathode
R37	15KΩ	1		BTS-15K	4th Video IF Amp. Screen
R38	1500Ω 20%	1		BTS-1500	4th Video IF amp. Decoupling
R39	1500	1		BTS-150	Decoupling - See note 3.
R40	3300Ω 5%	1		BTS-3300 5%	1st Video Amp. Grid
R41	2700Ω	1		BTS 2700	1st Video Amp. Cathode
R42	1800Ω 5%	1		BTS-1800 5%	1st Video Amp. Plate
R43	3900Ω	1		BTS-3900	Peaking Coil Shunt
R44	68KΩ	1		BTS 68K	Voltage Divider
R45	470KΩ 20%	1		BTS-470K	2nd Video Amp. Grid
R46	820Ω	1		BTS-820	2nd Video Amp. Cathode
R47	100KΩ	1		BTA-100K	2nd Video Amp. Screen
R48	68000Ω 5%	2		BTB-6800 5%	2nd Video Amp. Plate
R49	3300Ω	1		BTA-3300	Decoupling
R50	12KΩ	1		BTS-12K	Isolation
R51	4700Ω	1		BTS-4700	Isolation
R52	4700Ω	1		BTS-4700	DC Restorer Diode Load
R53	47Ω	1			Voltage Divider
R54	6800Ω	1		BTA-6800	Voltage Divider
R55	47KΩ	1		BTA-47K	Voltage Divider
R56	1.5Meg 20%	1		BTS-1.5Meg	Picture Tube Grid
R57	220KΩ 20%	1		BTS-220K	Sync. Separator Diode Load
R58	10KΩ 5%	1		BTS-10K	Voltage Divider
R59	470Ω	1		BTS-470	Voltage Divider
R60	100KΩ	1		BTA-100K	Aux. Video Plate
R61	3300Ω 5%	1		BTS-3300 5%	Aux. Video Grid
R62	47KΩ	1		BTS-47K	Aux. Video Cathode
R63	1Meg 20%	1		BTS-1Meg	AGC Rectifier Load
R64	2.2Meg 20%	1		BTS-2.2Meg	AGC Network
R65	100KΩ	1		BTS-100K	1st Sound IF Amp. Grid
R66	82Ω	1		BTS-82	1st Sound IF Amp. Cathode
R67	100KΩ 20%	1		BTS-100K	AVC Network
R68	100KΩ	1			2nd Sound IF Amp. Grid
R69	68Ω	1			Balancing
R70	27KΩ	1			De-emphasis
R71	10KΩ	1		BTS-10K	Tone Compensation
R72	10KΩ	1		BTS-10K	Ratio Det. Diode Load
R73	10KΩ	1		BTS-10K	Ratio Det. Diode Load
R74	10KΩ	1		BTS-10K	Ratio Det. Diode Load
R75	220KΩ 20%	1		BTS-220K	Voltage Divider
R76	2.2Meg 20%	1		BTS-2.2Meg	AVC Network
R77	10Meg 20%	1		BTS-10Meg	AF Amp. Grid
R78	270KΩ	1		BTS-270K	AF Amp. Plate
R79	470KΩ 20%	1		BTS-470K	Output Grid
R80	390Ω	1		BTA-390	Output Cathode
R81	1200Ω	2		BTB-1200	Output Decoupling
R82	1200Ω	2		BTB-1200	Voltage Divider
R83	10KΩ 20%	1		BTS-10K	Automatic Black Level Grid
R84	15KΩ 20%	1		BTS-15K	Automatic Black Level Plate
R85	47KΩ 20%	1		BTS-47K	Automatic Black Level Plate Decoupling
R86	22KΩ 20%	1		BTS-22K	1st Sync. Amp. Grid
R87	1Meg 20%	1		BTS-1Meg	1st Sync. Amp. Grid
R88	27KΩ	1		BTS-27K	1st Sync. Amp. Plate
R89	3300Ω 5%	1		BTS-3300 5%	2nd. Sync. Amp. Grid
R90	2200Ω 5%	1		BTS-2200 5%	2nd. Sync. Amp. Cathode
R91	12KΩ	1		3TS-12K	2nd. Sync. Amp. Plate
R92	3300Ω 5%	1		3TS-3300 5%	2nd. Sync. Amp.
R93	2200Ω 20%	1		BTS-2200 20%	2nd. Sync. Amp. Decoupling
R94	4300Ω 5%	2		BTB-4300 5%	Voltage Divider
R95	47KΩ	1		BTS-47K	Voltage Divider
R96	22KΩ	1		BTS-22K	Integrator Network
R97	8200Ω	1		BTS-8200	Integrator Network
R98	8200Ω	1		BTS-8200	Integrator Network
R99	330KΩ 20%	1		BTS-330K	Vert. Osc. Plate
R100	820KΩ	1		BTS-820K	Vert. Osc. Grid
R101	220KΩ 20%	1		BTS-220K	Vert. Osc. Grid
R102	3900Ω	1		BTS-3900	Vert. Peaking
R103	3.3Meg 20%	1		BTS-3.3Meg	Vert. Output Grid
R104	470Ω	1		BTS-470	Vert. Output Cathode
R105	100KΩ 5%	1		BTS-100K 5%	Horiz. AFC Rectifier Load
R106	100KΩ 5%	1		BTS-100K 5%	Horiz. AFC Rectifier Load
R107	12KΩ	1		BTA-12K	Decoupling
R108	3300Ω	1		BTS-3300	Horiz. Feedback
R109	470KΩ	1		BTS-470K	Horiz. AFC Filter
R110	1000Ω	1		BTS-1000	Horiz. MV Cathode
R111	47KΩ	1		BTS-47K	Horiz. MV Plate
R112	330KΩ	1		BTS-330K	Horiz. MV Plate
R113	500KΩ 5%	1		BTS-500K 5%	Horiz. MV Grid See Note 3
R114	330KΩ 5%	1		BTS-330K 5%	Voltage Divider

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
R115	390KΩ 5%	1		BTS-390K 5%	Voltage Divider
R116	82KΩ	1		BTS-82K	Voltage Divider
R117	470KΩ	1		BTS-470K	Horiz. Output Grid
R118	180Ω	2			Horiz. Output Cathode
R119	68Ω	1			Linearity Coil Shunt
R120	220Ω 20%	1		BTS-220	HV Osc. Decoupling
R121	220Ω	1		BTS-220	HV Osc. Decoupling
R122	3900Ω	1		BTA-3900	HV Osc. Grid
R123	470Ω 20%	1		BTS-470	HV Osc. Cathode
R124A	10KΩ	2	PA4205		Bias Network
B	5KΩ	2			Voltage Divider
R125	470KΩ	1			HV Filter
R126	2200Ω	1		BTA-2200	Focus Coil Shunt
R127	180Ω	2			Voltage Divider
R128	4700Ω	1		BTA-4700	Horiz. Output Screen

Note 1. Some Models use a 56KΩ Resistor in this application
Note 2. Some Models use a 130Ω Resistor in this application
Note 3. Some Models use a 470KΩ Resistor in this application

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T1	117VAC ⑥1.9A	730VCT .215ADC	5VAC ⑥3A	6.3VAC ⑥5.6A SEC. 3		P-8169	P-2955 P-2947 ①	TP-383 F0-66 ①
				6.3VAC ⑥5.0A				
T2	8.3VAC ⑥2.2A	5VAC ⑥2.0A			AB47002-1			

① Mount Below Chassis and use for Secondary #4

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T3	110Ω	580Ω		A-8111	A-3000	TB0-1 ②	Vert. Oscillator Trans.
T4	425Ω (.6Henry)						Horiz. Output Choke
T5	640Ω	6Ω		A-8115	A-3035	TB0-1	Vert. Output Trans.
T6	1.6Ω	540Ω SEC. 2					HV Oscillator Trans.
		16Ω SEC. 3					
		0Ω					
T7A	32Ω		PC-70003 ①		MD-13		Horiz. Deflection Coils
B	62Ω						Vert. Deflection Coils
T8	225Ω				MF-1		Focus Coil

② Drill New Mounting Holes
③ When yoke bears suffix A, both Horiz. & Vertical windings are reversed internally.
When yoke bears suffix B, the Horiz. winding is reversed internally
When yoke bears suffix C the Vert. winding is reversed internally.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
T9	6KΩ	3.5Ω	400Ω	.5Ω		A-3823	A-3020	RO-303	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA VIKING PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1A	PM	3.6Ω	PC63000-20	10J12 ②	1031 ②	② Drill New Mounting Holes
	CONE DIA.	V. C. DIA.				
SP1B	10"	1"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 v⁻¹	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.215ADC	70Ω	5Henries		C-1412 ②	C-3196 ②	R-7200 ②	②Drill new mounting holes.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L1	IF Wave Trap					Not used in all models.
L3	RF Wave Trap					Not used in all models
L4	RF Choke	.1Ω				
L5	Fil. Choke	.1Ω				
L6	Fil. Choke	.1Ω				
L7	Adj. Sound IF Trap	0Ω			TV-102	
L8	RF Trap	.1Ω				
L9	1st Video IF	.1Ω			TV-103	
L10	Fil. Choke	.1Ω				
L11	Adj. Sound IF Trap	0Ω			TV-102	
L12	2nd Video IF	.1Ω			TV-112	
L13	Fil. Choke	.1Ω				
L14	3rd Video IF	.1Ω			TV-102	
L15	Grid Choke	1.8Ω				
L16	Sound Take-off	0Ω	0Ω		TV-150	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L17	Fil. Choke	.1Ω				
L18	4th Video IF	.1Ω			TV-112	
L19	Grid Choke	1.8Ω				
L20	Sound Trap	0Ω			TV-150	
L21	Fil. Choke	.1Ω				
L22	5th Video IF	.1Ω			TV-112	
L23	Peaking Coil	2.8Ω			TV-180	25Microhenries
L24	Peaking Coil	6.5Ω			TV-181	95Microhenries
L25	Peaking Coil	6.5Ω			TV-181	95 Microhenries
L26	Peaking Coil	10.3Ω			TV-185	235 Microhenries
L27	Peaking Coil	8.4Ω			TV-184	150 Microhenries
L28	Peaking Coil	6Ω			TV-186	83 Microhenries
L29	Peaking Coil	7.8Ω				125 Microhenries
L30	Peaking Coil	10Ω			TV-184	200 Microhenries
L31	RF Choke					Not used in all Models
L32	RF Choke	.1Ω				
L33	RF Choke	.1Ω				
L34	Fil. Choke	.1Ω				
L35	Sound IF	.3Ω			TV-104	
L36	RF Choke					Not used in all Models
L37	Fil. Choke	.1Ω				
L38	Ratio Det. Trans.	.5Ω	.1Ω		TV-111	Tap at .3Ω
L39	Horiz. Lin.	17Ω			* MWC-1	Tap at 8.5Ω * Use Secondary only

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M1	RFTuner	19251	
M2	Neon Bulb		
M3	Switch		Off/On - Radio - TV
M4	Ion Trap		

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V29	FM RF Amplifier				
	FM Mixer	12AT7	12AT7	9A	
V30	AM Converter-FM Oscillator	6BE6	6BE6	7CH	
V31	1st FM AM IF Amp.	6BA6	6BA6	7BK	
V32	2nd FM IF Amp.	6BA6	6BA6	7BK	
V33	Ratio Detector	6AL5	6AL5	6BT	
V34	Det. AVC-AF Amp	6AV6	6AV6	7BT	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT DATA CENTRALAB PART No.	REPLACEMENT DATA CORNELL-DUBILIER PART No.	REPLACEMENT DATA ERIE PART No.	REPLACEMENT DATA SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C107	8	400	PA-4303-4	PR3450/8		BR845A		TVA-1704	Decoupling
C108	8	50	PA-4303-7	PR8150/8		BR815		TVA-1405	Stabilizing Cap.
C109	110		CC30H-111A	SI110					FM RF Coupling
C110	1000		HK35G-102	SI1000	D6-102	1WSD1	GP2L-102	5HK-D1	FM RF Amp. Cathode
C111	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	FM RF Amp. Grid
C112	110		CC30H-111A	SI110					FM RF Coupling
C113	.01	400	PC40H-103	P488-01	D6-103	PTE45I	GP2-333-103	47M-81	FM RF Amp. Dec.
C114	110		CC30H-111A	SI110					FM RF Coupling
C115	2		CC20A-020K				N20K-020		FM Osc. Coupling
C116	2		CC30H-020K				N750K-020		Fixed Trimmer
C117	51		CC30A-510K		TC2-51		N9G-333-510		Fixed Padder
C118	30		CC30H-300K		TCM-30		N750K-300		Osc. Grid Cap.
C119	10	500	MG50F-100	1469-00001		5S5Q1		MS-41	Fixed Trimmer
C120	110		CC30H-111A	SI110					AM RF Coupling
C121	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	Osc. Anode Bypass
C122	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	Conv. Fil.
C123	150		CC30G-151F				N470L-151		Fixed Trimmer
C124	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	Decoupling
C125	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	AVC Filter
C126	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	AVC Filter
C127	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	1st. IF Amp. Plate Dec.
C128	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	1st. IF Amp. Screen
C129	2000		HK35E-202	SI2000	D6-202	1WSD2	GP2-333-202	5HK-D2	2nd. FM IF Amp. Plate
C130	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	2nd. FM IF Amp. Screen
C131	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	2nd. FM IF Amp. Cathode
C132	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	RF Bypass
C133	1000		HK35G-102	SI1000	D6-102	1WSD1	GP2L-102	5HK-D1	Diode Load Cap.
C134	1000		HK35G-102	SI1000	D6-102	1WSD1	GP2L-102	5HK-D1	De-emphasis
C135A	100		YPA-4339-1	SI100	9PC-50	5WS75	GP1K-101	Y100C1	Diode RF Filter
B	100			SI100		5WS75	GP1K-101		Diode RF Filter
C136	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	Tone Comp.
C137	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	Audio Coupling
C138	110		CC30H-111A	SI110					AF Amp. Plate Bypass
C139	.02	400	PC40H1-203	P488-02	DF-203	PTE482		47M-S2	Audio Coupling
C140	.01	400	PC40H1-103	P488-01	D6-103	PTE481	GP2-333-103	47M-S1	Tone Comp.
C141	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	AVC Filter
C142	.05	600	PC40HM-503	P688-05	DF-503	PTE685		6TM-S5	RF Bypass
C143	.05	600	PC40HM-503	P688-05	DF-503	PTE685		6TM-S5	RF Bypass
C144	10000		PA-4334-2	BPD-01	DD-103	1D3S1	S21-01	5HK-S1	Fil. Bypass

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R129A	500KΩ	½	PA4402-4	Q13-133	AG-60-Z	BSK-60	Tone Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R129A per instructions.
R130A	1Meg	½	PA4408-2	Q18-137X	AT-103	BTSK-72	Volume Control - Tapped ⓐ 100KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R130A per instructions.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	SPARTON PART No.	IRC PART No.	
R131	220Ω	½	BR12S-221	BTS-220	FM RF Amp. Cathode
R132	470KΩ	½	BR12S-474		FM RF Amp. Grid
R133	2.2Meg	½	BR12S-225	BTS-2.2Meg	AVC Network
R134	470KΩ	½	BTS-474		FM Mixer Grid
R135	22KΩ	½	BR-223	BTS-22K	FM Osc. Grid
R136	2.2Meg	½	BR-225	BTS-2.2Meg	AVC Network
R137	1Meg	½	BR-105	BTS-1Meg	AVC Network
R138	4700Ω	½	BR-472	BTS-4700	FM Mixer Decoupling
R139	4700Ω	½	BR-472	BTS-4700	AM Converter Decoupling
R140	470KΩ	½	BR-474	BTS-470K	AVC Network
R141	68Ω	½	BR-680		FM AM IF Amp. Cathode
R142	15KΩ	½	BR-153		FM AM IF Amp. Screen
R143	4700Ω	½	BR-472	BTS-4700	FM AM IF Amp. Decoupling
R144	47KΩ	½	¶PA-4329-1	BTS-47K	Diode Filter
R145	68Ω	½	BR12S-680		2nd FM IF Amp. Cathode
R146	15KΩ	½	BR12S-153		2nd FM IF Amp. Screen
R147	4700Ω	½	BR12S-472	BTS-4700	2nd FM IF Amp. Decoupling
R148	47KΩ	½	BR12S-473		De-emphasis
R149	470Ω	½	BR12S-471		Balancing
R150	220Ω	½	BR12S		Balancing
R151	15KΩ	½	BR12S-153	BTS-15K	Ratio Det. Diode Load
R152	3Ω	2	PA4207-1		Series Filament - Wire Wound
R153	220KΩ	½	BR12S-224		AVC Network
R154	4.7Meg	½	BR12S-475		Delayed AVC Network
R155	220KΩ	½	BR12S-224		AF Amp. Plate
R156	15Meg	½	BR12S-156		AF Amp. Grid
R157	2750Ω	10	PA4200-9		Filter - Wire Wound
R158	1Meg	½	BR12S-105		Diode Load
R159	22KΩ	½			Tone Compensation
R160	3300Ω	½		BTS-3300	Ant. Isolation

¶ Items R144, C135A, C135B are combined in one unit.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SPARTON PART No.	MERIT PART No.	
L40	FM Ant. Coil	0Ω		AA6798-3		Wound on 1.5KΩ resistor
L41	RF Coil	.1Ω		AA6769-2		
L42	FM RF Coil	0Ω		PA5200-6		
L43	FM Osc. Coil	0Ω		PA5200-7		
L44	AM Loop Ant.	.7Ω		AC67008-6		
L45	Ant. Loading Coil	2.2Ω		AA6616-1		
L46	Fil. Choke	.1Ω		AA6798-6		
L47	AM Osc. Coil	.7	5.5Ω	AA6665-3	BC-397	
L48	Parasitic Suppressor	0Ω		AA6798-5		Wound on 22Ω resistor
L49	Parasitic Suppressor	0Ω		AA6798-5		Wound on 22Ω resistor
L50	1st FM IF	.2Ω	.5Ω	AA6667-1		
L51	1st AM IF	11Ω	11Ω	AA6668-5	BC-338	
L52	2nd FM IF	.3Ω	.5Ω	AA6667-3		
L53	2nd AM IF	11.5Ω	11.5Ω	AA6668-1	BC-340	
L54	Ratio Det. Trans.	1.8Ω	1.5Ω	AA6684-1		Tap ⓐ 1Ω

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA								REMARKS
	SPARTON PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M5		LQD-1J	"Q" or Q-33			96	0-1 or S-1 and 0-3 or S-3	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

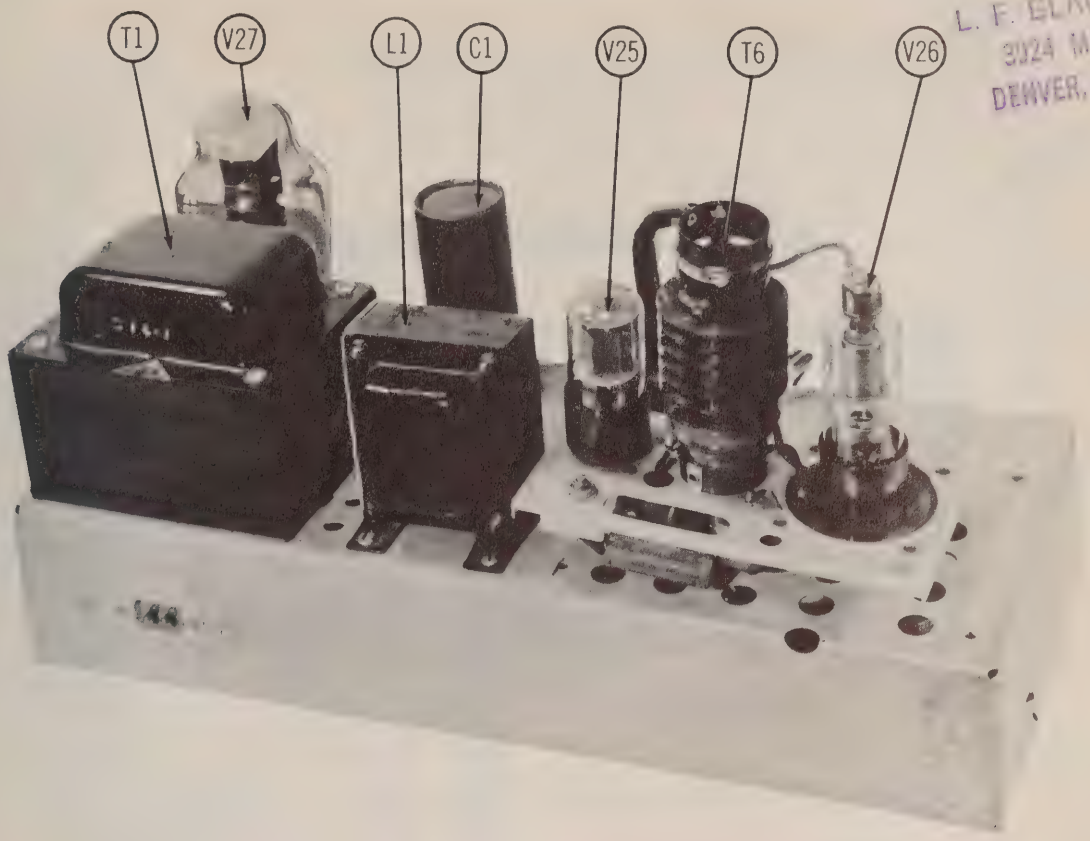
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SPARTON PART No.	WALCO PART No.	JENSEN PART No.	
M6		W-2A or W-2S and W-2MGA or W-2MGS	A-80 or A-81 A-80LP or A-81LP	

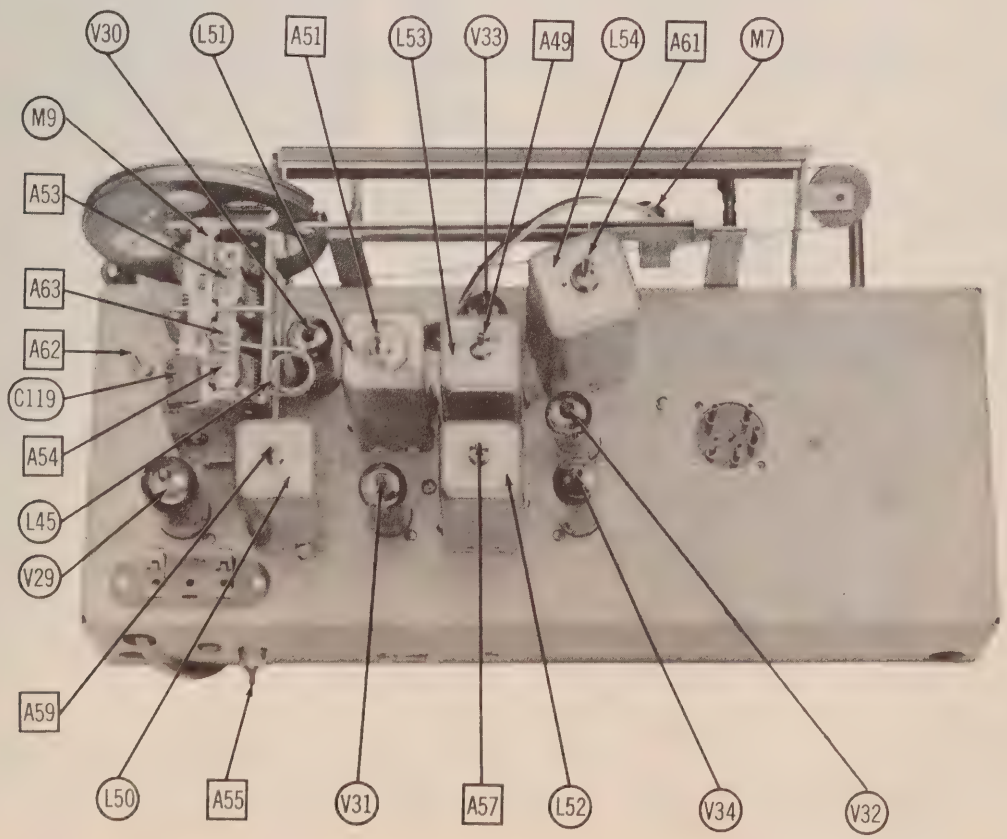
MISCELLANEOUS

ITEM No.	PART NAME SPARTON	SPARTON PART No.	NOTES
M8	Switch		AM FM Phono
M9	Tuning Cap		(25-472 MMF - 32-182MMF)

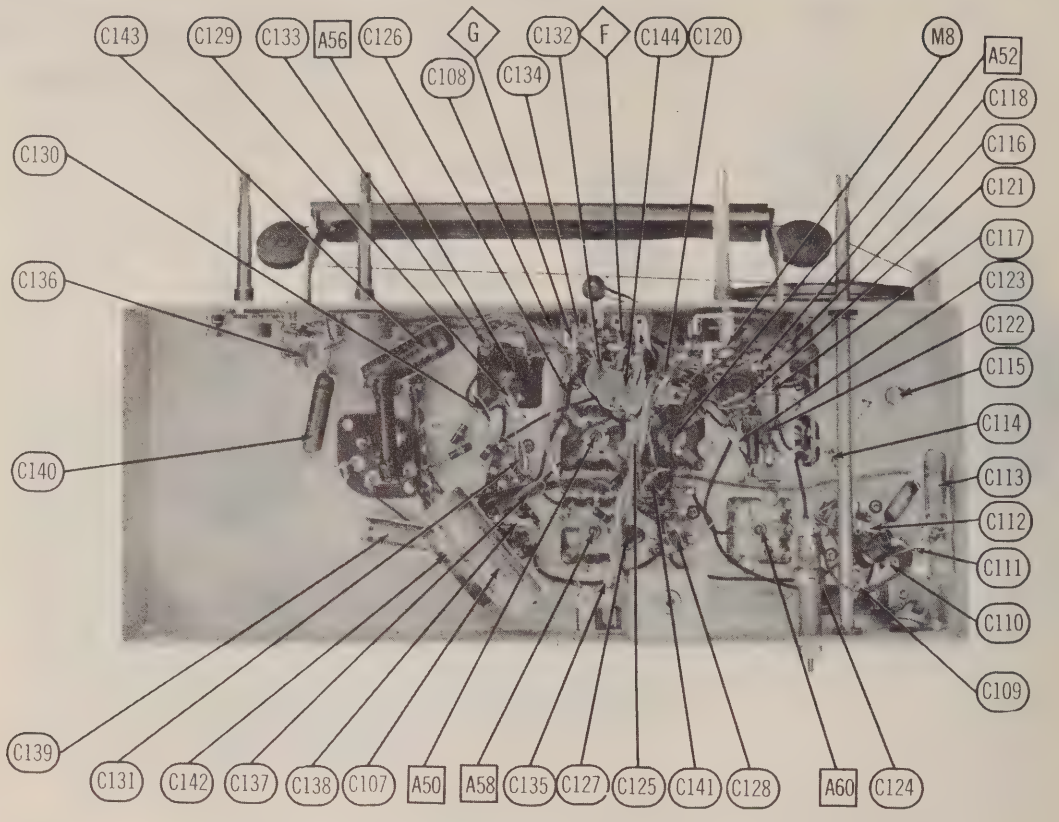
PROPERTY OF
L. F. BLANKENSHIP
3024 MEADE ST.
DENVER, COLORADO



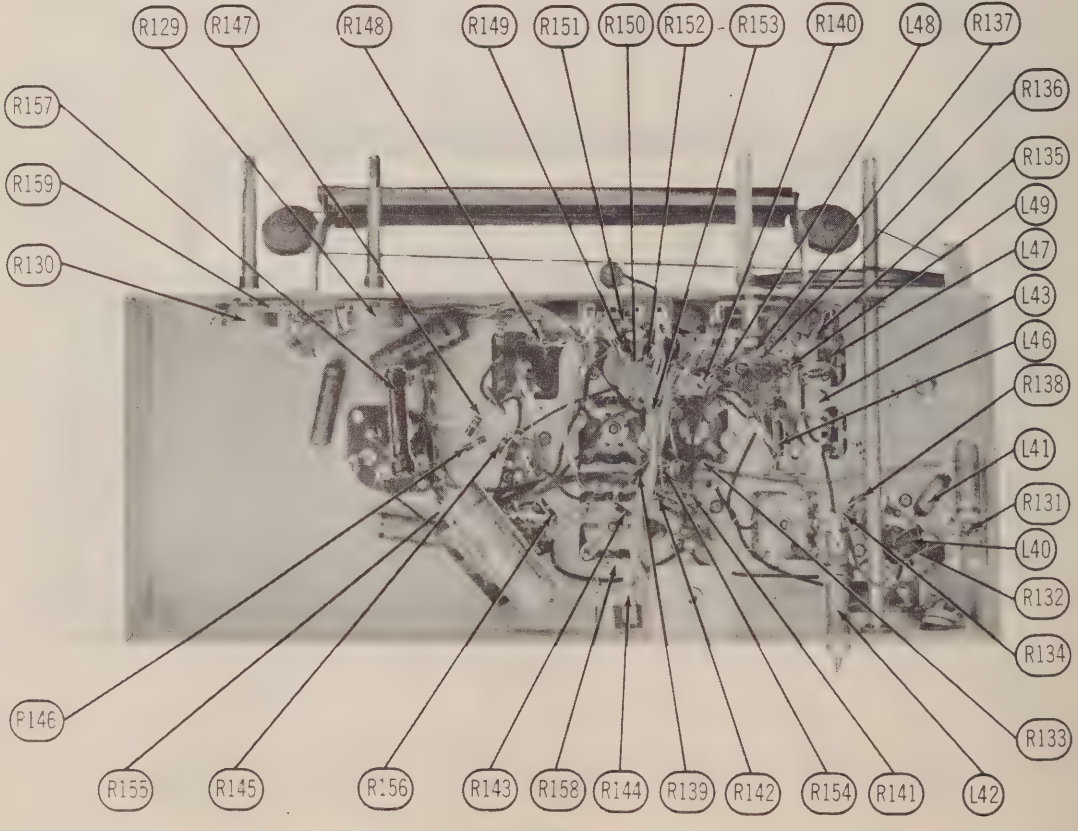
POWER SUPPLY CHASSIS-TOP VIEW



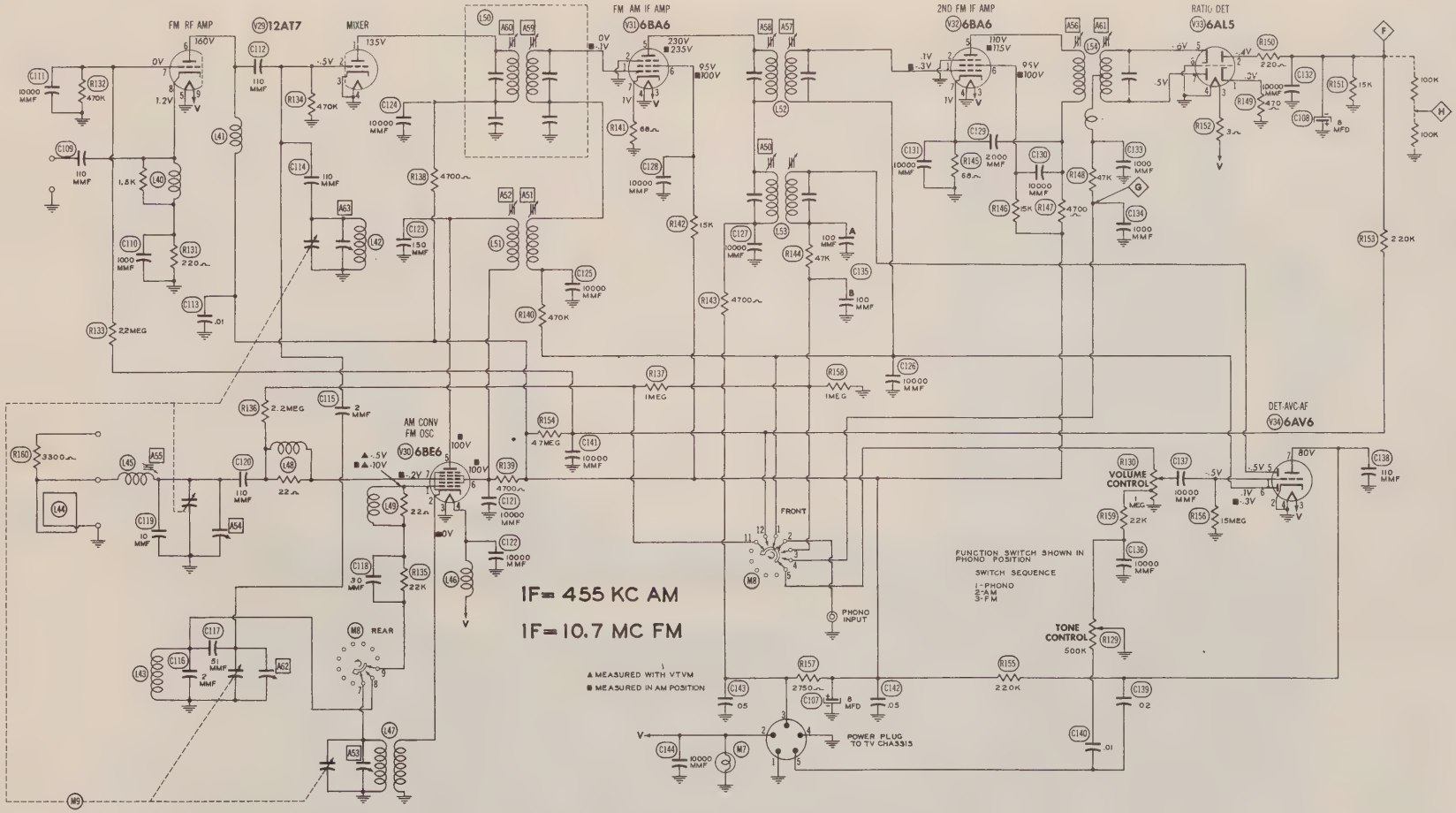
RADIO CHASSIS-TOP VIEW



RADIO CHASSIS - BOTTOM VIEW



RADIO CHASSIS - BOTTOM VIEW



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V29	12AT7	17.5KΩ	470KΩ	0Ω	0Ω	0Ω	12.7KΩ	470KΩ	230Ω	.1Ω
V30	6BE6	22KΩ 720KΩ ■23Meg	.8Ω	0Ω	.2Ω	17.5KΩ	17.5KΩ	■3.3Meg		
V31	6BA6		0Ω	1Ω	0Ω	14.7KΩ	118KΩ	68Ω		
V32	6BA6	250KΩ ■1.5Meg	0Ω	.1Ω	0Ω	17.5KΩ	118KΩ	68Ω		
V33	6AL5	470Ω	16KΩ	1.7Ω	0Ω	1Meg	0Ω	1Meg		
V34	6AV6	15Meg	0Ω	.1Ω	0Ω	k=650KΩ	1.7Meg	†220KΩ		
V 7										
V 8										
V 9										
V 10										

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS NOTED
† MEASURED FROM PIN 6 OF V27
■ MEASURED IN AM POSITION

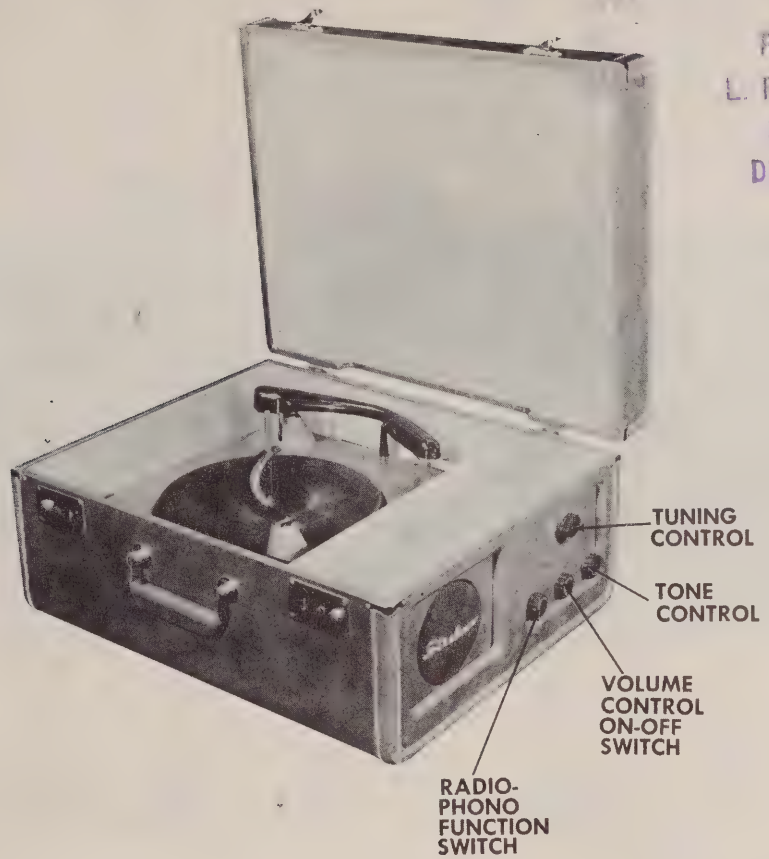
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1952

SPARTON
MODELS 4916, 4918, 4920, 4921, 4922

RADIO SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



STEELMAN
MODEL 595

TRADE NAME	Steelman Model 595
MANUFACTURER	Steelman Radio & Phonograph Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated Radio-Phono Combination with Loop Antenna
TUBES (FIVE)	Types 12BE6 Conv., 12SK7GT IF Amp., 14B6 Det. AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier.
POWER SUPPLY	110-120 Volts AC — RATING .24 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to Pin 7, (grid), of 12BE6 (V1). Low side to chassis.	455KC	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	" .	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune for max. output.	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT, SEE V-M MODEL 950 PHOTOFACT SET NO.107, FOLDER 13 OR RECORD CHANGER MANUAL CM-3

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12SK7GT	12SK7GT	8N	
V3	Det-AVC-AF Amp.	14B6	14B6	8W	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150		AFH2-15		UP5315		TVL-2432	■ Filter
B	30	150							▲ Filter
C2	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C3	150	500		1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	Diode RF Filter
C4	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C5	150	500		1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	AF Amp. Plate Bypass
C6	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C7	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C8	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Output Plate
C9	.02	400		P488-02		PJ4S2		4TM-S2	Line Filter
C10	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Line Isolation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½		Q13-137	AM-63-Z	B-70-S	Volume Control
B	Shaft			Not Req.	FS-3	Not Req.	Attach to R1A per instructions.
C	Switch			76-1	SW-A	Not Req.	Attach to R1A per instructions.
R2A	500KΩ	½		Q13-133	AM-60-Z	B-60	Tone Control
B	Shaft			Not Req.	FS-3	Not Req.	Attach to R2A per instructions.

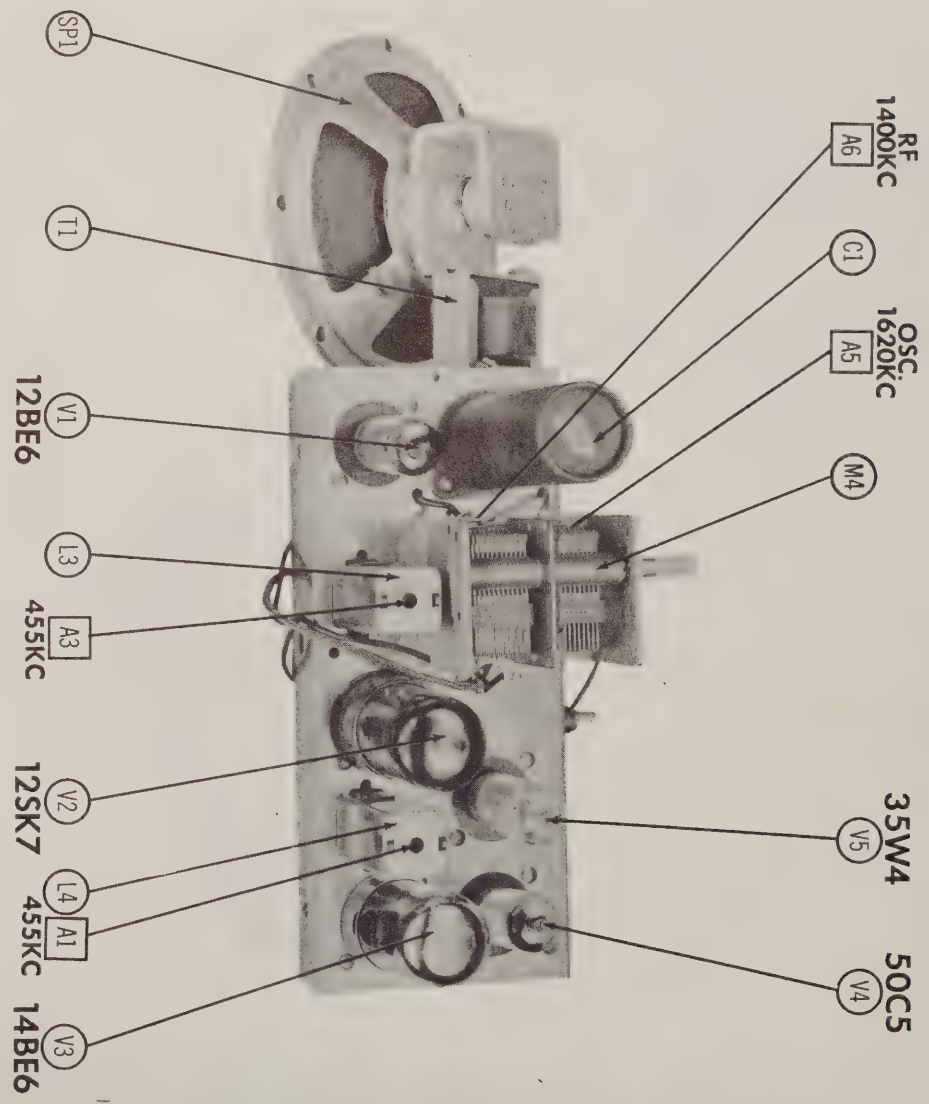
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	IDENTIFICATION CODES
R3	22KΩ	½		BTS-22K	Osc. Grid
R4	200KΩ	½		BTS-200K	IF Amp. Grid
R5	330Ω	1		BTA-330	IF Amp. Cathode
R6	2.2Meg	½		BTS-2.2Meg	AVC Network
R7	200KΩ	½		BTS-200K	Series Phono
R8	500KΩ	½		BTS-500K	Isolation
R9	10Meg	½		BTS-10Meg	AF Amp. Grid
R10	10Meg	½		BTS-10Meg	AF Amp. Grid
R11	200KΩ	½		BTS-200K	AF Amp. Plate
R12	150Ω	½		BTS-150	Output Cathode
R13	2700Ω	2		BTB-2700	Filter
R14	22Ω	½			Rectifier Ballast

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: STEELMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2.5KΩ	3.3Ω	165Ω	.4Ω	Part of SP-100	A-3332 ①	A-3025 ①		① Bend Mounting Tabs Down, File Out Slots and Mount on Original Bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.3Ω	SP-100	ST-105 Mod. PS-X	5A1	
	CONE DIA.	V. C. DIA.				
SP1B	5"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	STEELMAN PART No.	MERIT PART No.	
L1	Loop Ant.	3.2Ω				
L2	Osc. Coil	.4Ω	5.7Ω		BC-397	
L3	Input IF	20Ω	22Ω		BC-352	
L4	Output IF	20Ω	22Ω		BC-353	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	STEELMAN PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A-1 A-3	W22AB	A62A A65MG	96-T	0-1 or S-1 and 0-3 or S-3	

ASTATIC, SHURE, AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

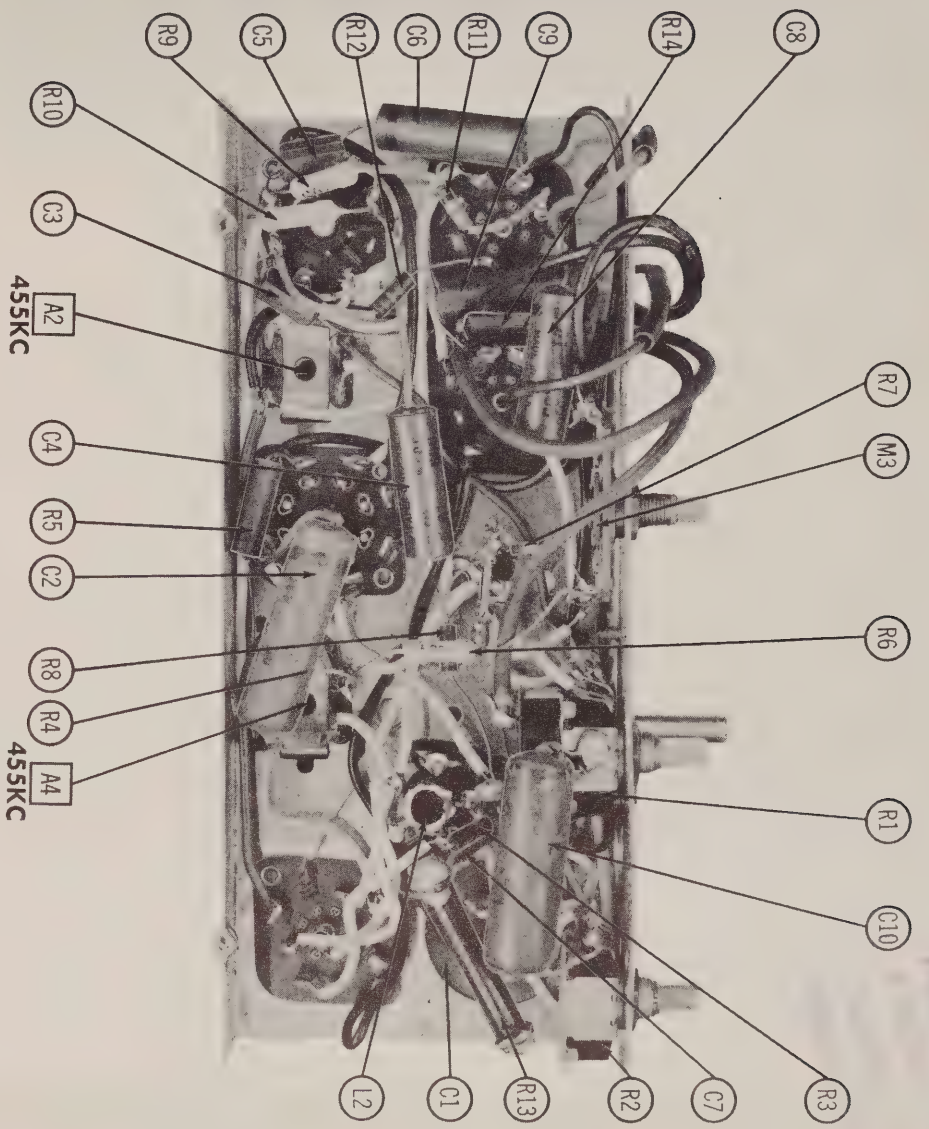
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

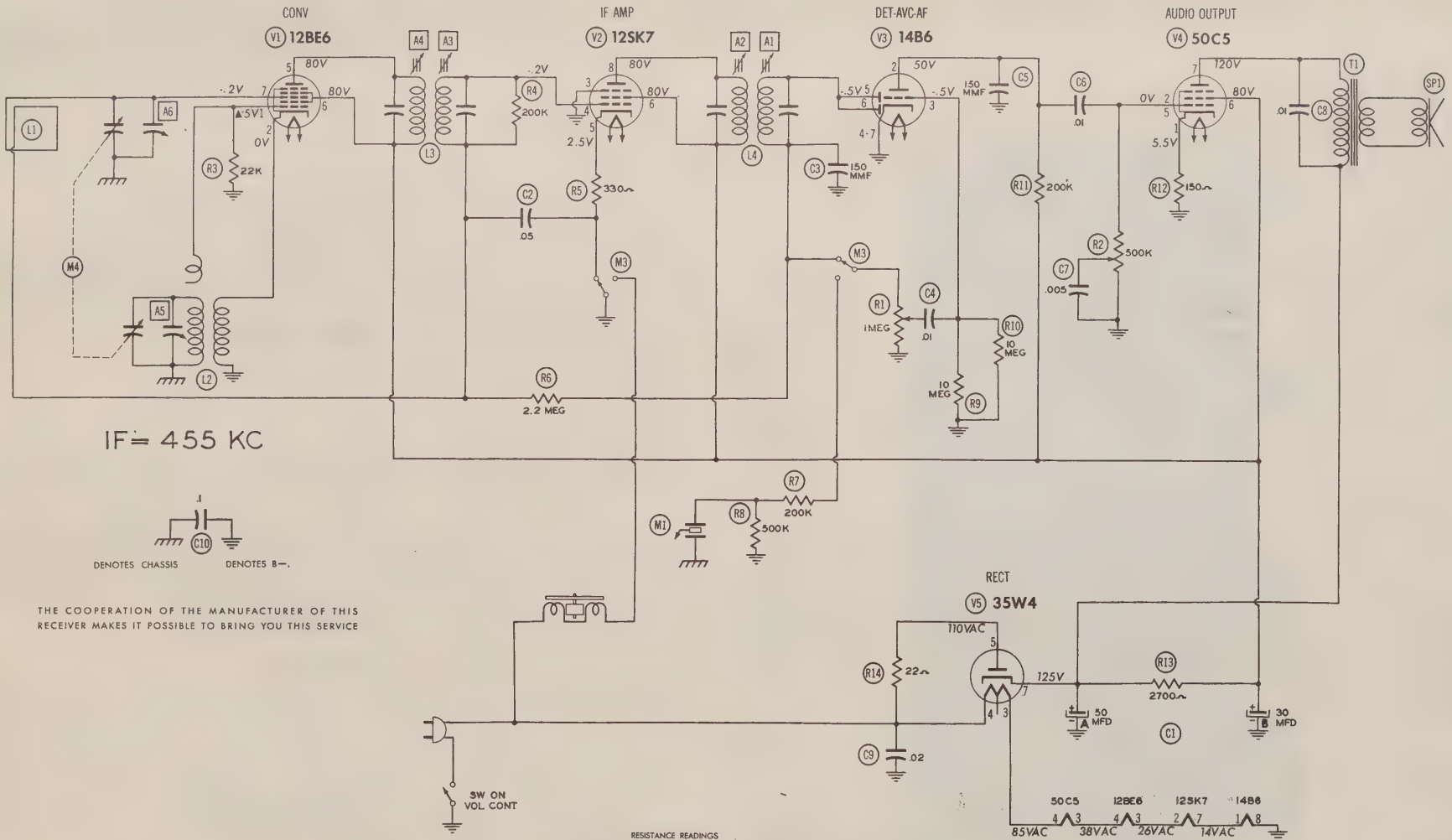
ITEM No.	REPLACEMENT DATA		JENSEN PART No.	REMARKS
	STEELMAN PART No.	WALCO PART No.		
M2		W-11A and W-11MGA	W-16 and W-17	

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M3 M4	Switch 2 Gang Var. Cap.		Radio - Phono (26-398MMF, 22-182MMF)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	22KΩ	.4Ω	26Ω	38Ω	†2.7KΩ	†2.7KΩ	3.2Meg	
V 2	12SK7GT	INF	26Ω	0Ω	3.2Meg	330Ω	†2.7KΩ	1ΔΩ	†2.7KΩ
V 3	14B6	1ΔΩ	†200KΩ	5Meg	0Ω	1Meg	1Meg	0Ω	0Ω
V 4	50C5	150Ω	500KΩ	38Ω	88Ω	500KΩ	†2.7KΩ	†165Ω	
V 5	35W4	INF	†0Ω	88Ω	123Ω	145Ω	105Ω	60KΩ	

SWITCH IN "RADIO" POSITION ONLY
† MEASURED FROM PIN 7 OF V5
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1952

164-10

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

STEWART-WARNER
MODEL 9204-A

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

STEWART-WARNER
MODEL 9204-A

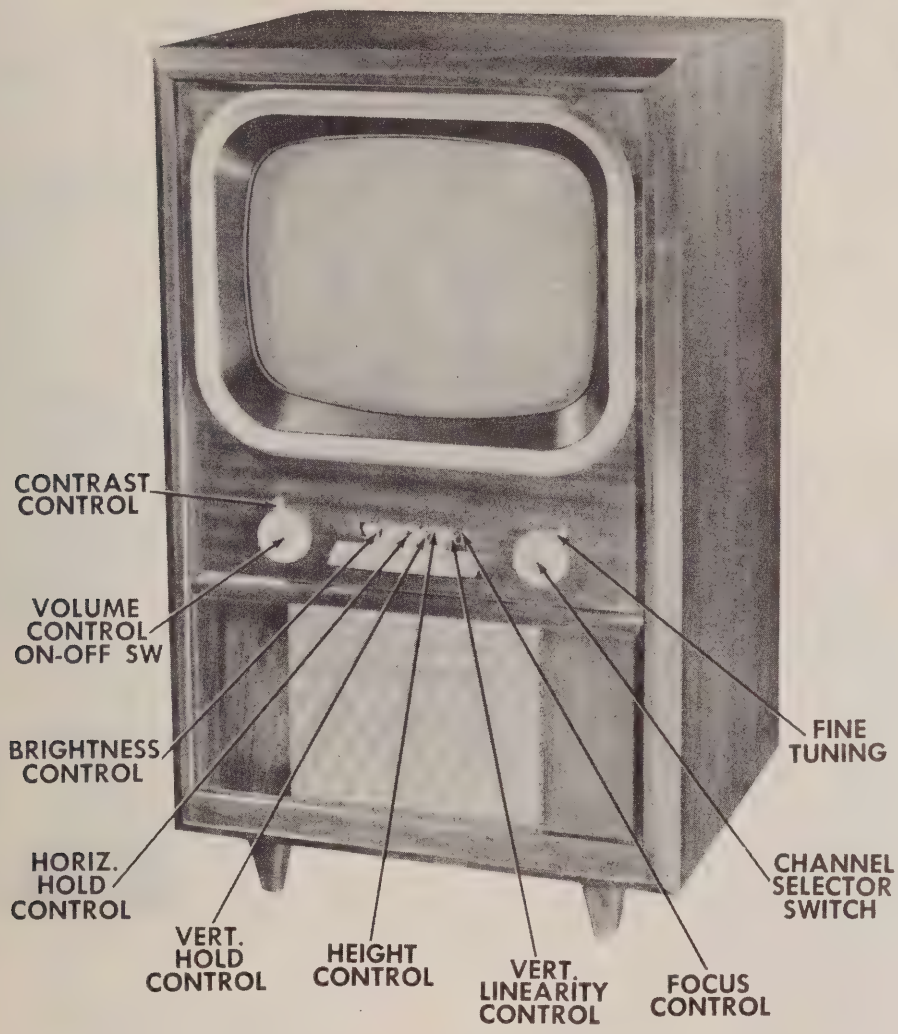
HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PROPERTY OF
F. BLANKENSHIP
3924

DATE 4-52 SET 164 FOLDER 11

PROPERTY OF



STEWART-WARNER
MODEL 9204-A

TRADE NAME	Stewart-Warner Model 9204-A
MANUFACTURER	Stewart-Warner Elect., Div. of Stewart-Warner Corp., Chicago 15, Ill.
TYPE SET	Television Receiver
TUBES	Nineteen

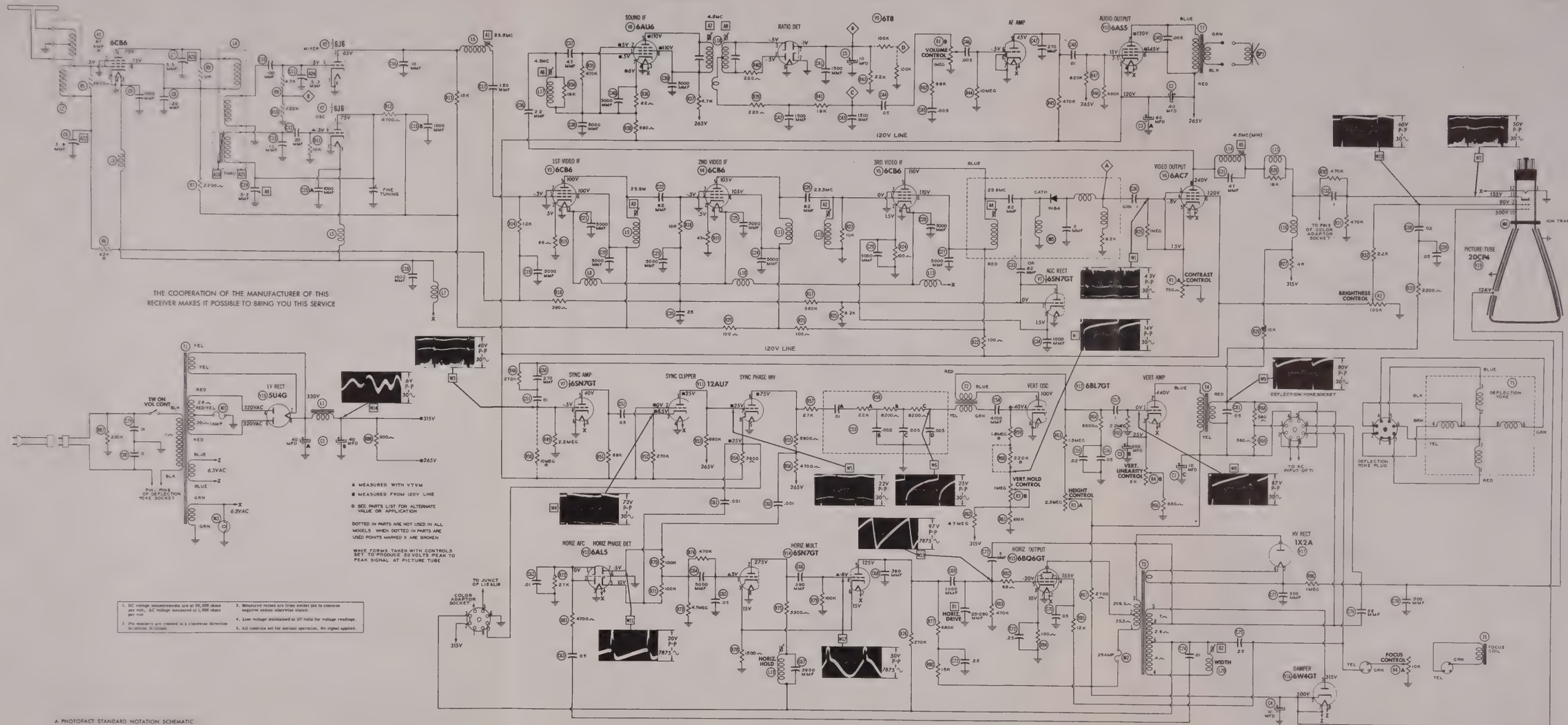
POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.7 Amp. @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13

INDEX

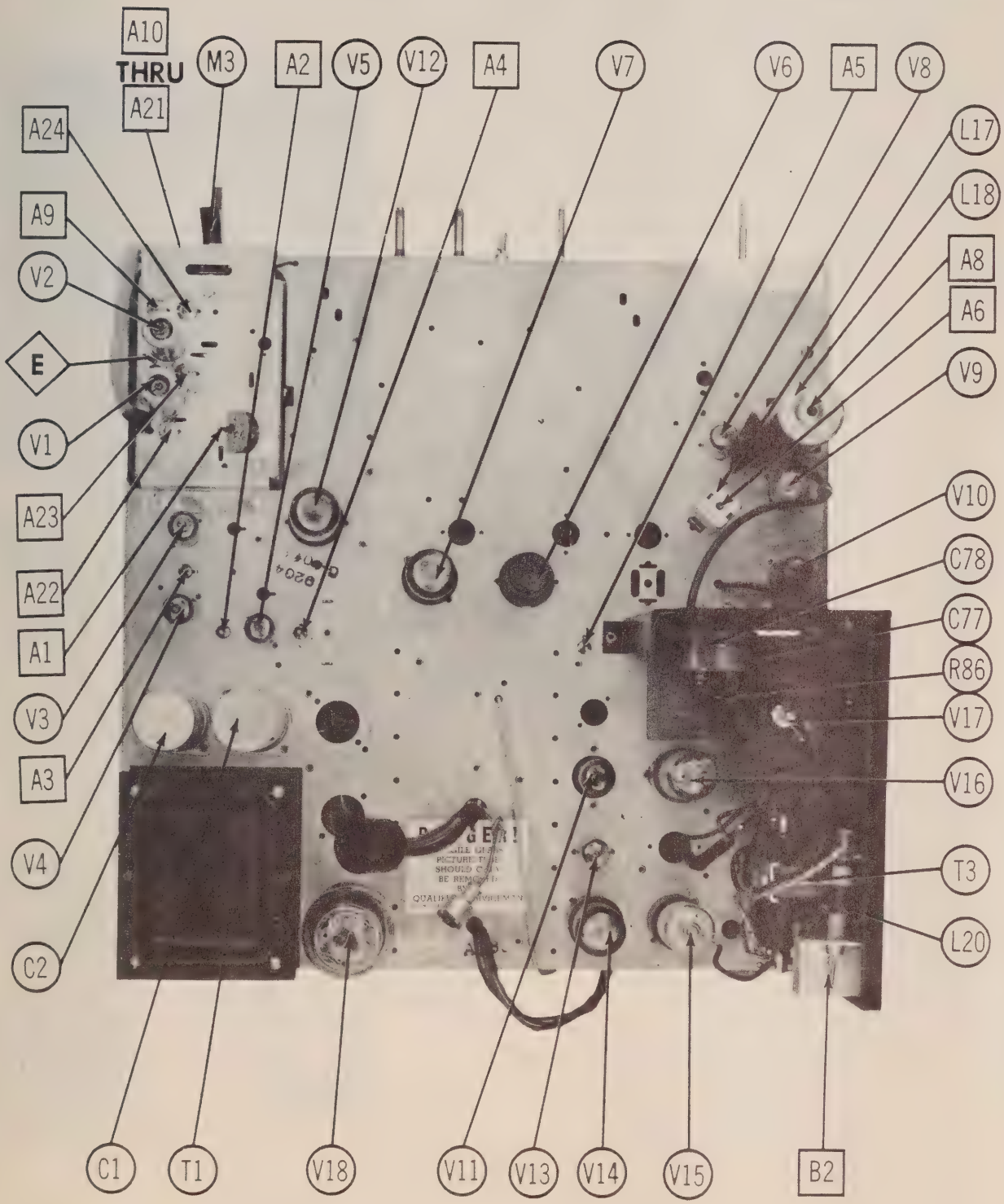
Alignment Instructions 6, 7
Disassembly Instructions 11
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 12, 13, 14
Photographs
Cabinet - Rear View 11
Capacitor and Alignment Identification..... 4, 9
Photographs (cont.)
Chassis - Top View 3
RF Tuner..... 10
Resistor and Inductor Identification 15, 16
Resistance Measurements 8
Schematic 2
Tube Placement Charts 5

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

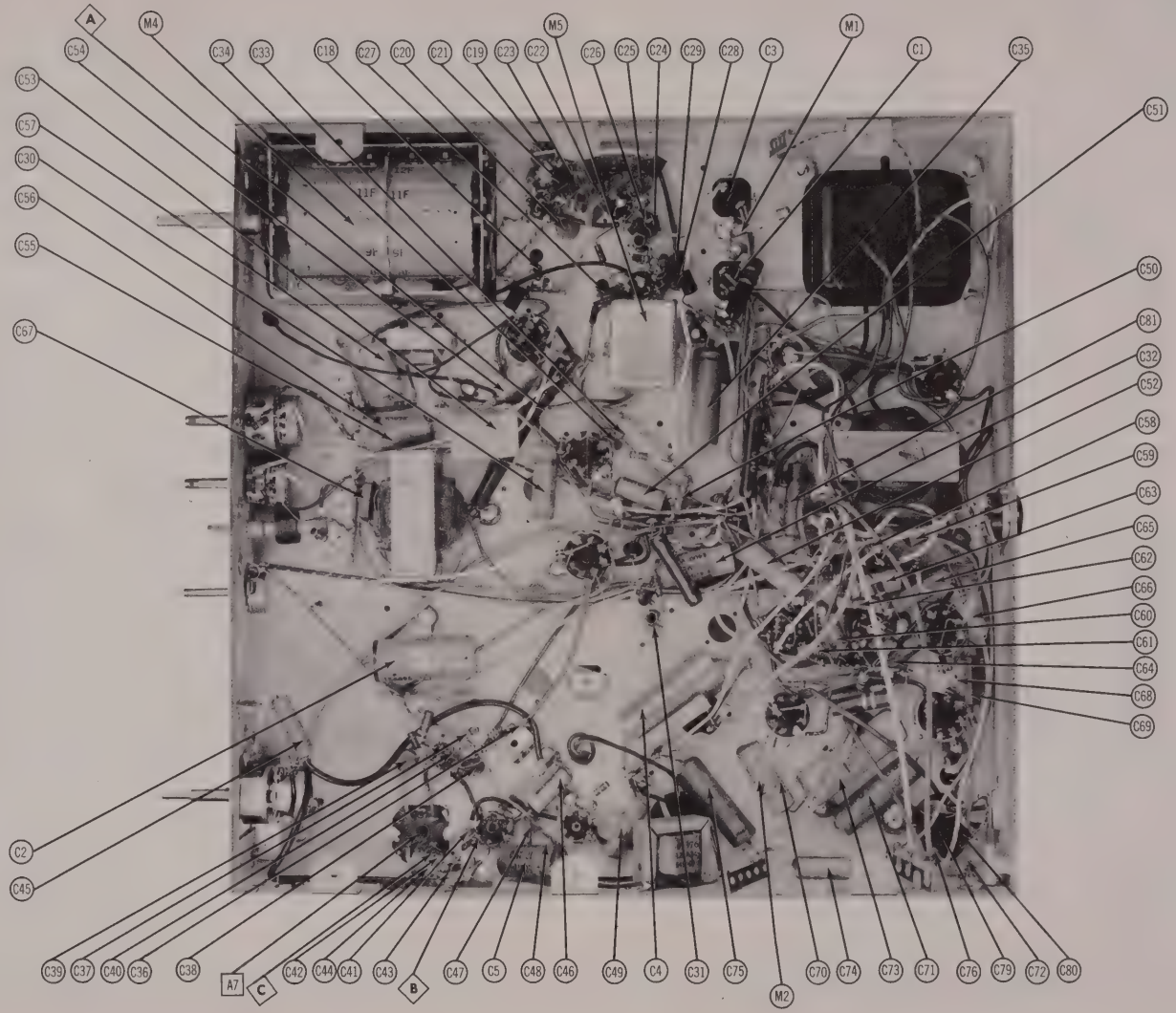
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
SOUND IF V8 6AU6
RATIO DET V9 6T8
AF AMP
AUDIO OUTPUT V10 6AS5
VOLUME CONTROL
120V LINE
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
VIDEO OUTPUT V6 6AC7
AGC RECT V7 6SN7GT
CONTRAST CONTROL
BRIGHTNESS CONTROL
PICTURE TUBE 20CP4
ION TRAP
SYNC AMP V7 6SN7GT
SYNC CLIPPER V11 12AU7
SYNC PHASE INV
VERT OSC V12 6BL7GT
VERT AMP
VERT. HOLD CONTROL
HEIGHT CONTROL
VERT. LINEARITY CONTROL
HORIZ AFC HORIZ PHASE DET V13 6AL5
HORIZ MULT V14 6SN7GT
HORIZ OUTPUT V15 6BQ6GT
HORIZ DRIVE
HORIZ HOLD
HV RECT V17 1X2A
DAMPER V16 6W4GT
WIDTH
FOCUS CONTROL
FOCUS COIL
DEFLECTION YOKE
DEFLECTION YOKE PLUG
TO AC INPUT OF T1
TO PINS OF COLOR ADAPTOR SOCKET
TO JUNCT OF L18 & L19
COLOR ADAPTOR SOCKET
LV RECT V18 5U4G
SW ON VOL CONT
PIN 7 OF DEFLECTION YOKE SOCKET
A MEASURED WITH VTVM
B MEASURED FROM 120V LINE
C SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as viewed from bottom of sockets.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1952
STEWART-WARNER MODEL 9204-A

STEWART-WARNER MODEL 9204-A



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

BOTTOM VIEW

TOP VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2) from its socket and replace it with a 6J6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C35, connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	23.5MC (unmod.)	Any	DC probe to Point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	25.9MC	"	"	A3, A4	

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	25MC (10MC swp.)	22.25MC 26.75MC	Any	Vert. amp. thru 47KΩ to Point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A1 thru A4 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD	High side to Point (A). Low side to chassis.	4.5MC (unmod.)	Any	DC probe thru detector (Fig.2) to cathode of picture tube. Common to chassis.	A5	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from Point B to chassis. The junction of these two resistors is alignment Point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to Point (A). Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point (B). Common to chassis.	A6, A7	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to Point (C). Common to Point (D).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to Point (A). Low side to chassis.	4.5MC (450KC swp)	4.5MC	Any	Vert. amp. to Point (B). Low side to chassis.	A6, A7	Disconnect stabilizor capacitor C5. Adjust for maximum amplitude & symmetry as per Fig. 3.
6.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A8	Reconnect capacitor C5. Adjust A8 so 4.5MC occurs at center of crossover lines a as per Fig. 4. SLIGHTLY retouch A7 for maximum amplitude & straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A9. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A9 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.
The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC swp.)	211.25MC 215.75MC	13	Vert. amp. thru 47KΩ to Point (A). Low side to chassis.	A10	Adjust to place sound marker as shown in Fig. 5. The video marker should be at 50%.
			207MC (10MC swp.)	205.25MC 209.75MC	12		A11	
			201MC (10MC swp.)	199.25MC 203.75MC	11		A12	
			195MC (10MC Swp.)	193.25MC 197.75MC	10		A13	
			189MC (10MC swp.)	187.25MC 191.75MC	9		A14	
			183MC (10MC swp.)	181.25MC 185.75MC	8		A15	
			177MC (10MC swp.)	175.25MC 179.75MC	7		A16	
			85MC (10MC swp.)	83.25MC 87.75MC	6		A17	
			79MC (10MC swp.)	77.25MC 81.75MC	5		A18	
			69MC (10MC swp.)	67.25MC 71.75MC	4		A19	
			63MC (10MC swp.)	61.25MC 65.75MC	3		A20	
			57MC (10MC swp.)	55.25MC 59.75MC	2		A21	

ALIGNMENT INSTRUCTIONS (CONT.)

RF & MIXER ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC swp.)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to Point E. Low side to chassis.	A22, A23 A24	Adjust for response curve similar to Fig. 6 with markers above 90%.
9.	"	"	213MC (10MC swp.)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 6. If markers fall below 70% on any channel, make slight compromise adjustment of A22, A23 & A24 with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC swp.)	199.25MC 203.75MC	11			
			195MC (10MC swp.)	193.25MC 197.75MC	10			
			189MC (10MC swp.)	187.25MC 191.75MC	9			
			183MC (10MC swp.)	181.25MC 185.75MC	8			
			177MC (10MC swp.)	175.25MC 179.75MC	7			
			85MC (10MC swp.)	83.25MC 87.75MC	6			
			79MC (10MC swp.)	77.25MC 81.75MC	5			
			69MC (10MC swp.)	67.25MC 71.75MC	4			
			63MC (10MC swp.)	61.25MC 65.75MC	3			
			57MC (10MC swp.)	55.25MC 59.75MC	2			

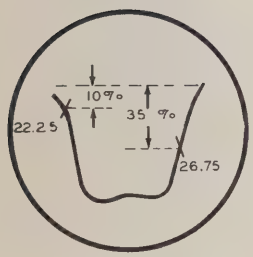


FIG.1

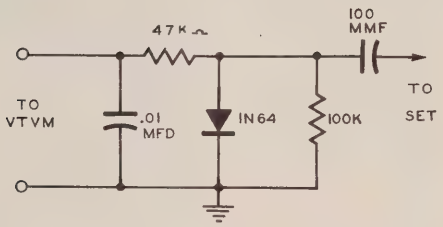


FIG. 2

FIG. 3

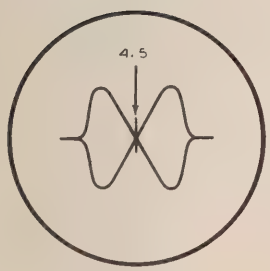


FIG. 4

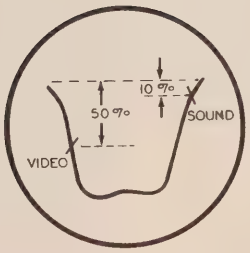


FIG.5

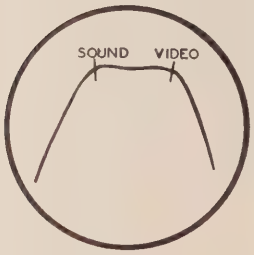


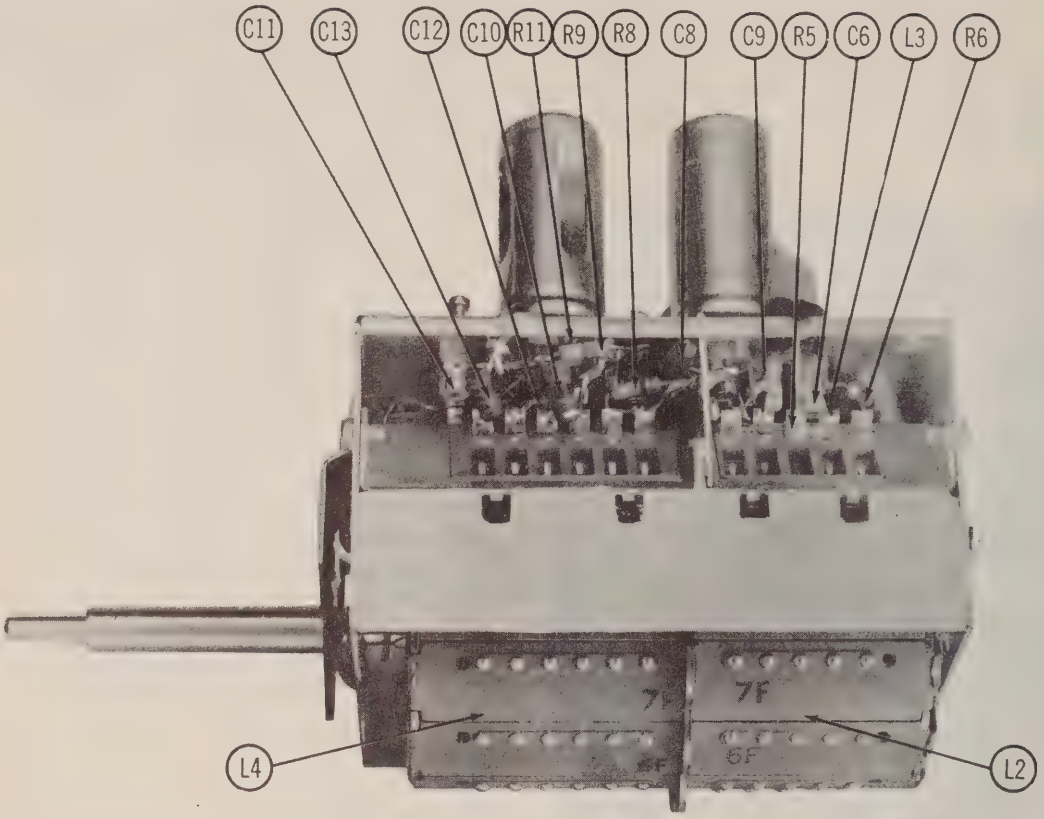
FIG.6

STEWART-WARNER MODEL 9204-A

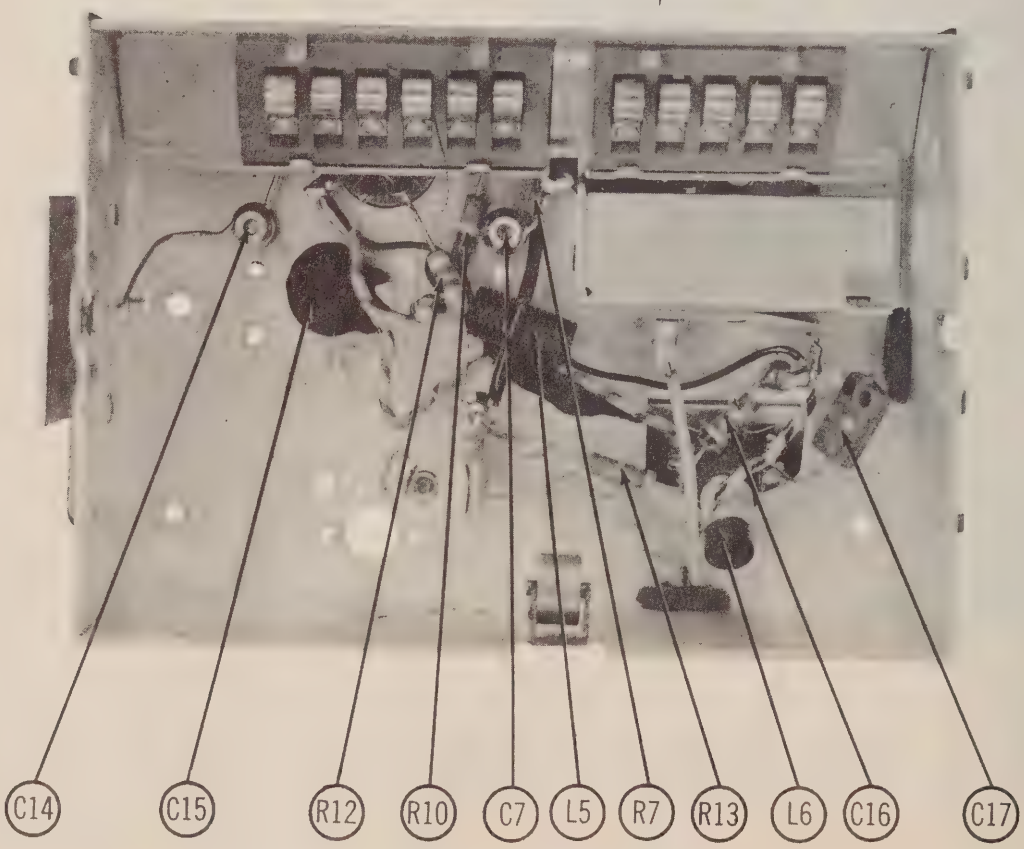
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	650KΩ	0Ω	.1Ω	0Ω	■2.5KΩ	■2.5KΩ	0Ω		
V 2	6J6	■5KΩ	■15KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	580KΩ	68Ω	.1Ω	0Ω	■300Ω	■300Ω	0Ω		
V 4	6CB6	580KΩ	47Ω	.1Ω	0Ω	■200Ω	■200Ω	0Ω		
V 5	6CB6	.2Ω	100Ω	.1Ω	0Ω	■100Ω	■100Ω	0Ω		
V 6	6AC7	0Ω	0Ω	130Ω	1Meg	130Ω	■0Ω	.1Ω	†4KΩ	
V 7	6SN7GT	8.2KΩ	8.2KΩ	100Ω	2.2Meg	■68KΩ	0Ω	0Ω	.1Ω	
V 8	6AU6	■470KΩ	■680Ω	.1Ω	0Ω	†5.4KΩ	†5.4KΩ	■760Ω		
V 9	6T8	INF	22KΩ	INF	.1Ω	0Ω	0Ω	0Ω	1ΩMeg	■470KΩ
V 10	6AS5	35KΩ	400KΩ	.1Ω	0Ω	400KΩ	†670Ω	†1.1KΩ		
V 11	12AU7	†680KΩ	■0Ω	■270KΩ	0Ω	0Ω	†12KΩ	†680KΩ	■3.9KΩ	.1Ω
V 12	6BL7GT	2.2Meg	#3.5KΩ	1.8KΩ	2.9Meg	#2.5Meg	0Ω	0Ω	.1Ω	
V 13	6AL5	27KΩ	27KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 14	6SN7GT	5.1Meg	†3.4KΩ	1.5KΩ	100KΩ	†270KΩ	1.5KΩ	.1Ω	0Ω	
V 15	6BQ6GT	INF	.1Ω	INF	†12KΩ	470KΩ	470KΩ	0Ω	100Ω	Top Cap #35Ω
V 16	6W4GT	INF	INF	110KΩ	INF	†80Ω	#0Ω	#0Ω	#.1Ω	
V 17	1X2A	PINS 1-9 HAVE INF RESISTANCE								Top Cap #330Ω
V 18	5U4G	#0Ω	12KΩ	INF	28Ω	0Ω	30Ω	INF	12KΩ	
V 19	20CP4	0Ω	40KΩ	Pin 10 #0Ω	Pin 11 290KΩ	Pin 12 .1Ω				

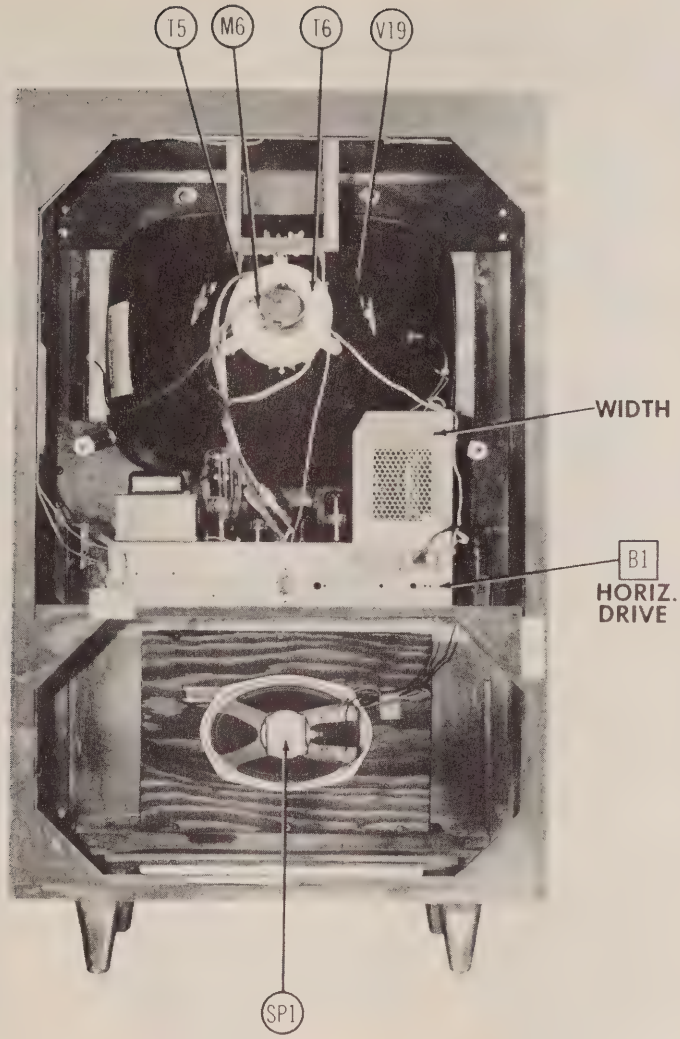
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V18
■ MEASURED FROM 120 VDC LINE



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold adjustment until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B1), counter-clockwise as far as possible without crowding or vertical lines appearing in the picture.

Adjust the width slug, (B2), until the picture is slightly wider than necessary to fill the mask horizontally.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push-on type control knobs from panel.
2. Remove 6 wood screws and remove rear cover.
3. Disconnect built-in antenna. Remove 2 wood screws and antenna bracket.
4. Disconnect picture tube.
5. Disconnect yoke and deflection coil plugs.
6. Remove ground strip from yoke bracket.
7. Disconnect speaker.
8. Remove 4 nuts holding speaker. Remove speaker.

Note: For picture tube removal it is necessary to remove chassis as outlined above.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6CB6	6CB6	7CM	
B	RF Amplifier	6AG5	6AG5	7BD	
C	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6AC7	6AC7	8N	
V7	AGC Rect.Sync. Amplifier	6SN7GT	6SN7GT	8BD	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector				
	AF Amplifier	6T8	6T8	9E	
V10	Audio Output	6A85	6A85	7CV	
V11	Sync. Clipper-Sync. Phase Inv.	12AU7	12AU7	9A	
V12	Vert. Oscillator Vert. Output	6BL7GT	6BL7GT	8BD	
V13	Horiz. AFC Phase Detector	6A L5	6A L5	6BT	
V14	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V16	Damper	6W4GT	6W4GT	6CG	
V17	HV Rectifier	1X2A	1X2A	9Y	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: SYLVANIA AND PART No.	RMA BASE TYPE	NOTES
V19	20CP4	20CP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Stewart-Warner PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	[illegible]	AFH3-43		UPT44145		TVL-3785	▲ Filter
B	40	450							● Filter
C	10	450							▲ Vert. Output Dec.
C2	40	300	[illegible]	PRS450/40		BR4035		TVA-1611	Decoupling
C3A	80	250	5090O2	AFH3-182		UPT10025- Y15		TVL-3722	▲ Decoupling ▲ Vert. Output Cathode
B	100	50							Decoupling
C4	15	600	508680	PRS700/10		BRHV810 .			Stabilizing Cap.
C5	10	150	505174	PRS150/12		BR1015		TVA-1406	Variable Trimmer
C6	3-9		509064		829-10				Variable Trimmer
C7	5-3		[illegible]		829-3				Variable Trimmer
C8	120		513439	S1120	D6-121	TM5T12	GP2K-121	SGA-T12	RF Amp. Decoupling
C9	1000		513009	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	RF Amp. Fil.
C10	100		513440	SI100	D6-101	TM5T1	GP1K-101	SGA-T1	RF Coupling
C11	.5-3		507968		829-3				Variable Trimmer
C12	20		513441	SI20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C13	10		513442	S10N750	TCN-10		N750K-100	STCU-Q1	Fixed Trimmer
C14	5-3		[illegible]		829-3				Variable Trimmer
C15A	1000	]	508576	S1D2-2X001	DD-2-102		SI2-001	5HK-2D1	Conv. Fil..
B	1000	]							RF Bypass
C16	10		513444	SI10NP0	TCZ-10		NP0K-100	STCC-Q1	Fixed Trimmer
C17	120		512542	SI120	D6-121	TM5T12	GP2K-121	SGA-T12	IF Coupling
C18	1000		513009	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	Fil. Bypass
C19	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	AGC Network
C20	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	1st Video IF Dec.
C21	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	1st Video IF Fil.
C22	82		513016	SI82		GP1K-820			IF Coupling
C23	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	AGC Filter
C24	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	2nd Video IF Dec.
C25	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	2nd Video IF Fil.
C26	82		513016	SI82			GP1K-820		IF Coupling
C27	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	3rd Video IF Dec.
C28	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	3rd Video IF Fil.
C29	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	3rd Video IF Cathode
C30	.1	200	512033	P288-1		P2P1		2TM-P1	Video Coupling
C31	47		513438		TCZ-47		NP0L-470	STCC-Q47	Fixed Trimmer
C32	.1	400	512035	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C33	82		513016	SI82			GP1K-820		IF Coupling
C34	1000		513009	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	AGC Cathode
C35	.25	200	512045	P488-25		P2P25		2TM-P25	AGC Filter
C36	2.2		513001		TCZ-2.2		NP0K-2R2		Sound IF Coupling
C37	47		513002	SI47	D6-470	TM5Q5	GP1K-470	5GA-Q47	Sound IF Coupling
C38	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	Sound IF Grid Dec.
C39	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	Sound IF Decoupling
C40	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	Sound IF Cathode
C41	1500		513010	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	RF Bypass
C42	1500		513010	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	RF Bypass
C43	1500		513010	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	De-emphasis
C44	.05	200	512027	P288-05	DF-503	P2S5		2TM-S5	Audio Coupling
C45	.005	600	512007	P688-005	DE-502	PTE5D5	GP2-333-502	6TM-D5	Tone Comp.
C46	.005	600	512007	P688-005	D6-502	PTE5D5	GP2-333-502	6TM-D5	Audio Coupling
C47	270		[illegible]	SI270	D6-271	5WST3	GP2K-271	5GA-T27	AF Amp. Plate Bypass
C48	.01	400	512041	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C49	.005	600	512007	P688-005	D6-502	PTE5D5	GP2-333-502	6TM-D5	Audio Output Plate
C50	270		513006	SI270	D6-271	5WST3	GP2K-271	5GA-T27	Syncl. Coupling
C51	.01	600	512013	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync. Coupling
C52	.05	400	512039	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C53A	.01	]		P688-01		PTE6S1	GP2-333-103		Vert. Sync. Coupling
B	.002	]	▲ 508062	P688-002	DD-103 †	PTE6D2	GP2-333-203	5HK-S1 †	Vert. Integrator Net.
C	.005	]		P688-005	PC-100	PTE6D5	GP2-333-502	101C1	Vert. Integrator Net.
D	.005	]		P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C54	4700	500	512533	1467-005		1DR5D5		MS-25	Vert. Osc. Grid Cap.
C55	.02	600	512019	P688-02	DF-203	PTE6S2		6TM-S2	Vert. Discharge
C56	.05	600	512308	P688-05	DF-503	PTE6S5		6TM-S5	Vert. Discharge
C57	1	600	512037	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling

* Items C53A, C53B, C53C, C53D, R58A, R58B, R58C are combined in one unit
† Install DD-103 in series with PC-100 Input Lead
† Install 5HK-S1 in series with 101C1 Input Lead

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STEWART WARNER PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58	.02	600	512019	P688-02	DF-203	PTE6S2		6TM-S2	Vert. Sweep Coupling
C59	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Integrator Net.
C60	.001	600	512001	P688-001	D6-102	PTE5D1	GP2L-102	6TM-D1	Horiz.Sync. Coupling
C61	.001	600	512001	P688-001	D6-102	PTE5D1	GP2L-102	6TM-D1	Horiz.Sync. Coupling
C62	.01	600	512009	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Voltage Divider
C63	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Feedback
C64	5000		513013	BPD-005	DD-502	TM5D5	SI1-005	5HK-D5	Horiz. AFC Filter
C65	.05	200	512027	P288-05	DF-503	P2S5		2TM-S5	Horiz. AFC Filter
C66	390	500	512535	1469-0004		5RST4		MS-34	Horiz. MV Feedback
C67	3900	500	512540	1464-004		1DR5D4			Fixed Trimmer
C68	390	500	512535	1469-0004		5RST4		MS-34	Horiz. Discharge
C69	1000	500	513515	1464-001		1R5D1		MS-21	Horiz. Sweep Coupling
C70	.05	600	512039	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C71	.25	200	512045	P488-25		P2P25		2TM-P25	Horiz. Output Cathode Horiz. Feedback
C72	5.1	1500	513028						Damper Filter
C73	.25	600	512049	684-25		PTE6P25		6TM-P25	
C74	.01	600	512013	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Trimmer
C75	.25	200	512045	P488-25		P2P25		2TM-P25	Horiz. Sweep Coupling Fixed Trimmer
C76	56	1500	513027			HV30C	TV3-502	MM-B30TS	HV Filter
C77	500	20000	508888			HV30C	TV3-502	MM-B30TS	HV Filter
C78	500	20000	508888			HV30C	TV3-502	MM-B30TS	HV Filter
C79	.01	400	512255	P488-01		PTE4S1		4TM-S1	Line Filter
C80	.01	400	512255	P488-01		PTE4S1		4TM-S1	Line Filter
C81	.05	200	512027	P288-05		P2S5		2TM-S5	Fixed Trimmer

* Items C53A, C53B, C53C, C53D, R58A, R58B, R58C are combined in one unit
† Install DD-103 in series with PC-100 Input Lead
† Install 5HK-S1 in series with 101C1 Input Lead

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	750Ω	2	509314		RTV-309		Contrast Control - Wire Wound Panel
B	1Meg	½					Volume Control & SW - Tapped @ 250KΩ Rear
R2A	100KΩ	½	509893		AG-49-S		Brightness Control
B	Shaft		Not Req.	QU-128	RS-2		Attach to R2A per instructions
R3A	2.5Meg	½	508893	Bil-239 *	RTV-313		Height Control - Panel
B	1Meg	½		Bil-137 *			Vert. Hold Control - Rear
C	Shaft End		Not Req.	E187 *	Not Req.		Attach per instructions in "Concentrikit"
R4A	10KΩ	4	509302				Focus Control - Panel - Wire Wound
B	5KΩ	½					Vert. Linearity Control-Rear

* Additional Parts to be used with "Concentrikit"

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Stewart-Warner PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS 10% UNLESS OTHERWISE NOTED
R5	3900Ω	½	510147	BTS-3900	Antenna Coil Shunt
R6	82KΩ	½		BTS-82K	RF Amp. Grid - See note 1.
R7	2200Ω 20%	½	510143	BTS-2200	RF Amp. Screen
R8	10KΩ 20%	½	510155	BTS-10K	RF Coil Shunt
R9	4700Ω 20%	½	510149	BTS-4700	Mixer Grid
R10	220KΩ 20%	½	510179	BTS-220K	Mixer Grid
R11	10KΩ 20%	½	510155	BTS-10K	Osc. Grid
R12	4700Ω	½	510149	BTS-4700	Osc. Plate
R13	15KΩ 20%	½	510158		Mixer Plate
R14	12KΩ 5%	½	510723		1st Video IF Amp. Grid
R15	68Ω 20%	½	510116		1st Video IF Amp. Cathode
R16	390Ω	½	510129	BTS-390	AGC Network
R17	560KΩ	½	510186	BTS-560K	AGC Network
R18	10KΩ	½	510154		2nd Video IF Amp. Grid
R19	47Ω	½	510113		2nd Video IF Amp. Cathode
R20	100Ω 20%	½	510119	BTS-100	Decoupling
R21	100Ω 20%	½	510119	BTS-100	Decoupling
R22	100Ω 20%	½	510149	BTS-100	Decoupling
R23	10KΩ	½	510154		3rd Video IF Amp. Grid
R24	100Ω	½	510118	BTS-100	3rd Video IF Amp. Cathode
R25	8200Ω	½	510153	BTS-8200	AGC Rectifier Plate
R26	1Meg 20%	½	510191	BTS-1Meg	Video Amp. Grid
R27	4000 Ω	5	510753	1.3/4A-4000	Video Amp. Plate - Wire Wound
R28	18KΩ 5%	½	510745	BTS-18K 5%	Peaking Coil Shunt
R29	10KΩ	½	510154	BTS-10K	Isolation
R30	470KΩ	½	510184	BTS-470K	Picture Tube Cathode
R31	470KΩ	½	510184	BTS-470K	Picture Tube Cathode
R32	220KΩ	½	510160	BTS-220K	Picture Tube Cathode
R33	2200Ω	½	510142	BTS-2200	Vert. Blanking Network
R34	18KΩ	½	510159		Sound IF Coil Shunt
R35	470KΩ	½	510184		Sound IF Amp. Grid
R36	82Ω	½	510117	BTS-82	Sound IF Amp. Cathode
R37	4700Ω 20%	1	510249	BTA-4700	Sound IF Amp. Decoupling
R38	680Ω 20%	½	510134	BTS-680	Decoupling
R39	220Ω	½	510124		Balancing
R40	220Ω	½	510124		Balancing
R41	18KΩ	½	510159	BTS-18K	De-emphasis
R42	68KΩ 20%	½	510170	BTS-68K	Tone Compensation
R43	22KΩ	½	510160	BTS-22K	Ratio Det. Diode Load
R44	10Meg 20%	½	510197	BTS-10Meg	AF Amp. Grid
R45	470KΩ	½	510184	BTS-470K	AF Amp. Plate
R46	680KΩ 5%	½	510746	BTS-680K 5%	Output Grid
R47	820KΩ 5%	½	510747	BTS-820K 5%	VoltageDivider
R48	270KΩ	½	510180	BTS-270K	Isolation
R49	2.2Meg 20%	½	510193	BTS-2.2Meg	Sync. Amp. Grid
R50	10Meg	½	510197	BTS-10Meg	Sync. Amp. Grid - See Note 4
R51	68KΩ	½	510169	BTS-68K	Sync. Amp. Plate
R52	270KΩ	½	510180	BTS-270K	Sync. Clipper Cathode
R53	560KΩ	½	510187	BTS-560K	Sync. Phase Inverter Grid
R54	3900Ω 5%	½	510748	BTS-3900 5%	Sync. Phase Inverter Cathode
R55	6800Ω	½	510151	BTS-6800	Sync. Phase Inverter Plate
R56	4700Ω 5%	½	510750	BTS-4700 5%	Sync. Phase Inverter Plate
R57	27KΩ	½	510162	BTS-27K	Integrator Network
R58A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½	508062 *	BTS-8200	Integrator Network
C	8200Ω	½		BTS-8200	Integrator Network

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEWART WARNER PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R59	1.8Meg 5%	½	510769	BTS-1.8Meg 5%	Vert.Osc. Grid - See Note 2
R60	220Ω	½	510124	BTS 220	Vert. Osc. Grid - See Note 3
R61	100KΩ	½	510766	BTS-100K	Bias Network
R62	4.7Meg	½	510768	BTS-4.7Meg	Bias Network
R63	1.5Meg	½	510767	BTS 1.5Meg	Vert. Osc. Plate
R64	6800Ω	½	510151	BTS-6800	Vert. Peaking
R65	2.2Meg 20%	½	510193	BTS-2.2Meg	Vert. Output Grid
R66	680Ω	½	510134	BTS 680	Vert. Output Cathode
R67	2700Ω	2	510344	BTB-2700	Decoupling
R68	560Ω	½	510132	BTS-560	Damping
R69	560Ω	½	510132	BTS-560	Damping
R70	100KΩ 5%	½	510751	BTS-100K 5%	Horiz. AFC Diode Load
R71	100KΩ 5%	½	510751	BTS-100K 5%	Horiz. AFC Diode Load
R72	27KΩ	½	510162	BTS-27K	Horiz. AFC Diode Load
R73	4.7Meg 20%	½	510195	BTS-4.7Meg	Horiz. AFC Diode Load
R74	470KΩ	½	510184	BTS-470K	Horiz. AFC Filter
R75	3300Ω	½	510145	BTS 3300	Horiz. MV Plate
R76	270KΩ	½	510180	BTS 270K	Horiz. MV Plate
R77	680KΩ	½	510187	BTS-680K	Horiz. MV Plate
R78	1500Ω	½	510139	BTS-1500	Horiz. MV Cathode
R79	100KΩ	½	510172	BTS-100K	Horiz. MV Grid
R80	15KΩ	2	510357	BTB-15K	Decoupling
R81	4700Ω	½	510248	BTS-4700	Horiz. AFC Feedback
R82	68Ω	½	510116		Parasitic Suppressor
R83	470KΩ	½	510184	BTS-470K	Horiz. Output Grid
R84	100Ω	1	510218	BW-1-100	Horiz. Output Cathode
R85	12KΩ	5	510758	1 3/4A-12K	Horiz. Output Screen - Wire Wound
R86	1Meg	2	510390		HV Filter
R87	220KΩ 20%	½	510179	BTS-220K	Line Isolation
R88	600Ω	10	510741	1 3/4A-600	Filter - Wire Wound

Note 1. Some Models use a 47KΩ Resistor in this application (Part #510167)
Note 2. Some Models use a 3Meg Resistor in this application (Part #510769)
Note 3. Not used in all Models
Note 4. 10Meg Resistor, Part #510197, is used when letter "E" is included in series designation at rear of chassis.
● Items R58A, R58B, R58C, C53A, C53B, C53C are combined in one unit

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.7A	640VCT @ .210ADC	5VAC @ 3A	6.3VAC @ 7.4A SEC.4 6.3VAC @ 1.2A	509380	P-8315 P-8134 ①	P-3067 ②	TP-370 ②

① Mount beneath Chassis
② Add Series Resistor to reduce Plate Voltage

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	153Ω	940Ω	508076	A-8111 ③	A-3000 ④	T30-1 ④	Vert. Oscillator Trans.
T3	395Ω @ 35.5Ω	3.7Ω Tapped @ .4Ω & 3Ω	509384		HV0-7 ⑤		Horiz. Output Trans.
		SEC. 2 0Ω					
T4	800Ω Tapped @ 92		509375	A-8123 ⑤	A-3037	T30-5	Vert. Output Trans.
T5A	16Ω		115185 ⑥	DY-8	MDF-70		Horiz. Deflection Coils
B	48Ω						Vert. Deflection Coils
T6	12, 500Ω		182326 ⑥				Focus Coil

③ Drill One New Mounting Hole
④ Mount on Top of Chassis.
⑤ Replace with coil with MWC-1
⑥ Includes cable and plug

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T7	5KΩ	3.5Ω	450Ω	.9Ω	509376	A-2930	A-3877 ②	RO-8	③ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1A	P.M	3.5Ω	508174	ST-810 Mod. P69-V	69A2	
	CONE DIA.	V. C. DIA.				
SP1B	6" X 9"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 ~PI	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
L1	.210ADC	73Ω	2.9 Henries	508341	C-2991 ③	C-2325	TR-3300 ③	③ Drill One New Mounting Hole

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Stewart Warner PART No.	MERIT PART No.	
L2	Ant. Coil	0Ω	0Ω	507952		Channel 2
L3	Fil. Choke	0Ω		507970		
L4	RF, Mixer Grid & Osc. Coil	0Ω		507972		Channel 2
L5	Fil. Choke	0Ω		507971		
L6	lst. Video IF	.6Ω		509061		Includes slug Part #509062
L7	Fil. Choke	0Ω		507584		
L8	Fil. Choke	0Ω		507584		
L9	2nd. Video IF	.1Ω		507343	TV-103	Less Slug Part #507357
L10	Fil. Choke	0Ω		507584		
L11	RF Choke	2.5Ω		507367		
L12	3rd. Video IF	.1Ω		507343	TV-102	Less Slug Part #507357
L13	Fil. Choke	0Ω		507584		
L14	4.5MC Trap	1.6Ω		509603	TV-151	Includes Condenser C31 and Slug Part #507357
L15	Peaking Coil	11Ω		509341	TV-185	
L16	Peaking Coil	14Ω		509342	TV-188	
L17	Sound IF	1.3Ω		509378		
L18	Ratio Det. Trans.	4Ω	.7Ω	509706	TV-110 *	Tap at .8Ω *Drill New Mounting Holes
L19	Horiz. Osc.	80Ω		508967	TV-163	Includes Slug Part #508963
L20	Width Coil	1.4Ω		509361	MWC-2	Includes Slug Part #507429

FUSES

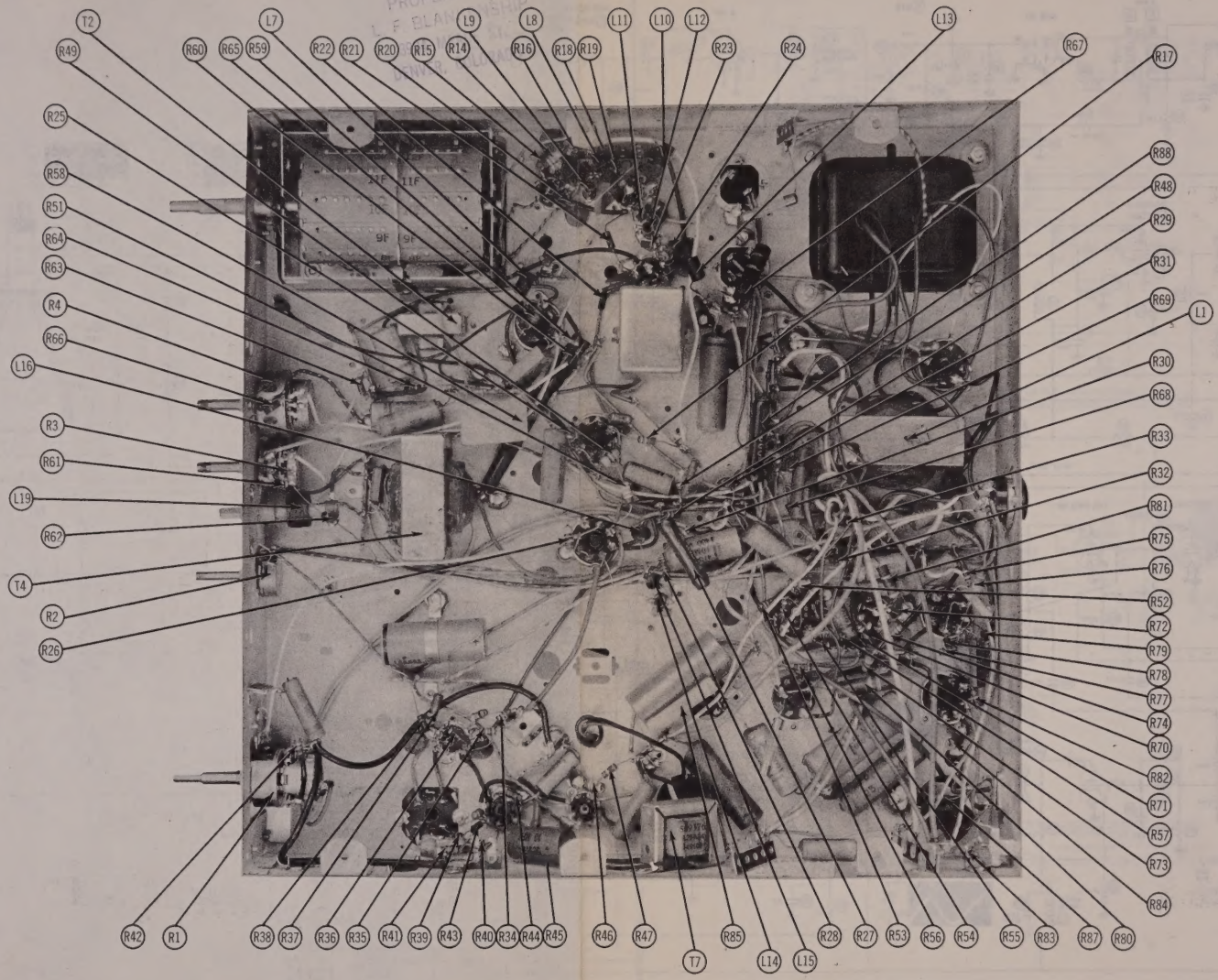
ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			Stewart Warner PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	1A. 250V	509517		318001		
M2	3AG Pigtail	1/4A-250V	508063		318.250		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Stewart Warner PART No.		
M3	Bayonet	6-8	.15	Brown	118921		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	Stewart Warner PART No.	NOTES
M4	RF Tuner	508890	Complete with tubes
M5	4th Video IF	509613	
	Capacitor	513016	82MMF
	RF Choke	507367	
	Crystal	509386	1N64
	Capacitor	513432	5MMF Video Det. Assy.
	Peaking	509340	
	Peaking	509342	
	Resistor	510153	8.2KΩ
M6	Ion Trap	509688	
B1	Trimmer	520127	25-280MMF (Horiz. Drive)
	Ant. Coils	507953	Channel #3
	Ant. Coils	507954	Channel #4
	Ant. Coils	507955	Channel #5
	Ant. Coils	507956	Channel #6
	Ant. Coils	507957	Channel #7
	Ant. Coils	507958	Channel #8
	Ant. Coils	507959	Channel #9
	Ant. Coils	507960	Channel #10
	Ant. Coils	507961	Channel #11
	Ant. Coils	507962	Channel #12
	Ant. Coils	507963	Channel #13
	RF, Mixer Grid & Osc. Coil	507973	Channel #3
	RF, Mixer Grid & Osc. Coil	507974	Channel #4
	RF, Mixer Grid & Osc. Coil	507975	Channel #5
	RF, Mixer Grid & Osc. Coil	507976	Channel #6
	RF, Mixer Grid & Osc. Coil	507977	Channel #7
	RF, Mixer Grid & Osc. Coil	507978	Channel #8
	RF, Mixer Grid . & Osc. Coil	507979	Channel #9
	RF, Mixer Grid & Osc. Coil	507980	Channel #10
	RF, Mixer Grid & Osc. Coil	507981	Channel #11
	RF, Mixer Grid & Osc. Coil	507982	Channel #12
	RF, Mixer Grid & Osc. Coil	507983	Channel #13
	Cabinet	520130	
	Escutcheon	520128	For Window
	Glass	520129	
	Knob	509019	Contrast
	Knob	509018	Off/On Volume
	Knob	509017	Fine Tuning
	Knob	509016	Channel Selector
	Washer	509487	Felt for Contrast Knob



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION